

COMMODORE

user

Incorporating
Vic Computing

March 1985
Price 95/-

SUPER HEROES GREAT DOUBLE BILL



CONAN
APPEARING INDIANA JONES
ON YOUR 64 TONIGHT

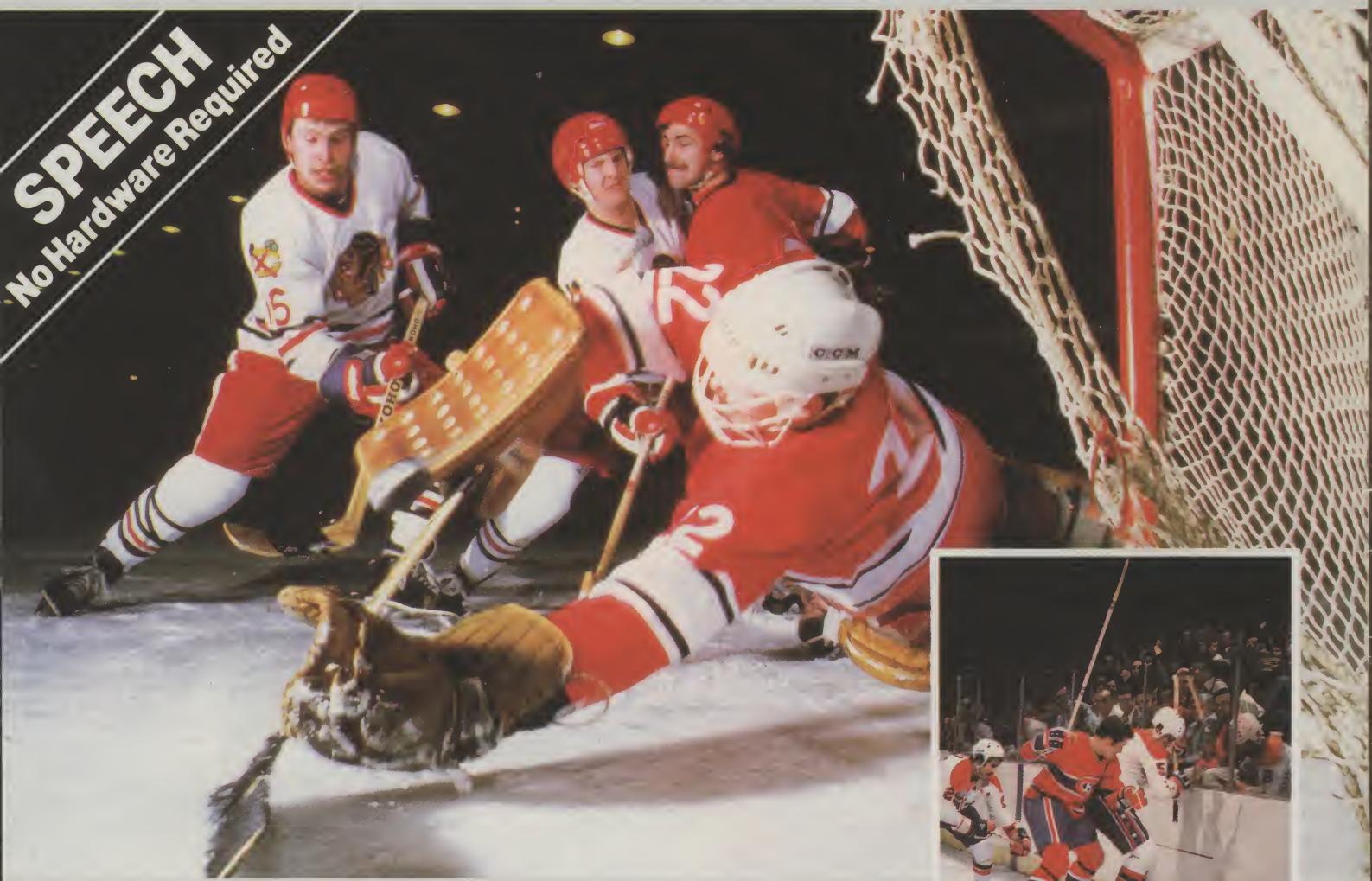
WIN
THE ENTIRE
US GOLD RANGE

FAST AND FURIOUS

SLAP SHOT

ANIROG

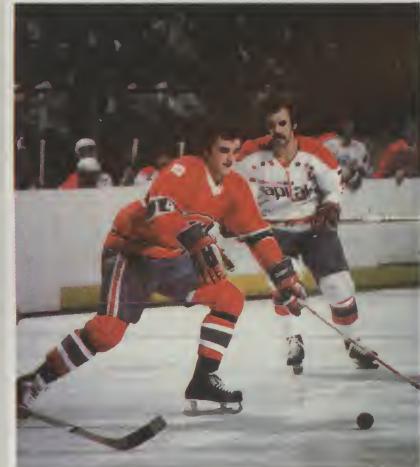
SPEECH
No Hardware Required



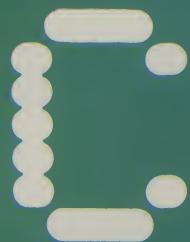
ALL ACTION ICE HOCKEY

SLAPSHOT from Anirog is a two player, fast action, ice hockey program. Also in this thrilling game there is included a smoothly running speech synthesis system of the very highest quality. Before the actual game starts each player must select an international hockey team to represent. After doing this you must quickly and skilfully manoeuvre your man across the glistening ice whilst your other team-mates move automatically around the rink waiting for you to pass the puck to them. If you do manage to race past the opposing defence then you have a chance to shoot for goal and score. However, you still have the goalie to beat who is able to dive in all directions. Also included in this amazingly quick and totally original game is the ability to actually physically bodycheck your opponents. Never the less, do not be too aggressive otherwise you could incur a "roughing penalty", resulting in a faceoff in your own end, giving the opposing side an easy chance of scoring. Also other extra features available include: Pause mode, and three levels of play ranging from fast to slow as well as a re-start option. Slapshot from Anirog is a totally original two player game with lightning fast action never seen before on the Commodore 64.

Two J.S. Commodore 64 Cassette £8.95 Disk £10.95



Trade Enquiries: ANIROG SOFTWARE LTD. UNIT 10 VICTORIA IND. PARK VICTORIA ROAD DARTFORD KENT (0322)92513/8
Mail Order: 8 HIGH STREET HORLEY SURREY 24 HOUR CREDIT SALES HORLEY 02934 6083



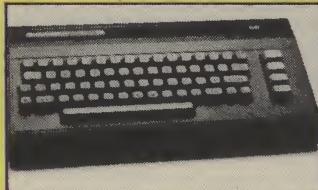
CONTENTS

COMMODORE User

MARCH 1985

5 NEWS

Special report from the Consumer Electronics Show in Las Vegas, plus more of the latest news in the Commodore world



12 TAKE THREE TABLETS

We look at three drawing tablets for the Commodore 64 that let you draw on a flat surface rather than use keyboard or joystick



17 C-16 SOFTWARE SUPPORT

The C-16 has been selling well, but are there any games you can play on it? We asked around for some opinions about the machine — there's also an indispensable list of what's available



21 MICRO-WAVE RADIO

Introducing a new series to broaden your horizons. In the next four months, we'll show you how to use your Vic or 64 to get on the air-waves



24 ADVENTURE

This month, we look at the latest American brain-bashers to cross the Atlantic, a new adventure chart and, of course, a regular competition



27 TURTLES ON THE MOVE

Chris Durham introduces the LOGO language and reviews a new turtle from Valiant Designs



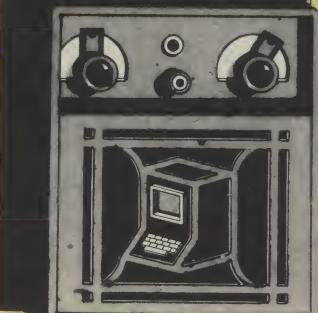
33 COMPETITION

Here's a nearly once in a lifetime chance to win the complete range of US Gold software, plus 20 runners-up prizes. Just answer another set of our ridiculously simple questions



36 SOUND EFFECTS WITH SID

This month's SID offering lets you in on the delights of hard sync and ring modulation. What? Oh, we show you how to get some good sound effects



REGULARS

40 BOOK REVIEWS

We review two teach-yourself guides to assembly language, and a new general guide to the Vic

49 SCREEN SCENE

Exclusive review of Conan and Indiana Jones

45 THE HAPPY HACKER

61 VICTUALS

Solitaire for the 64, a brain-teaser for the C-16, something arty for the Vic —

Our who's hacking who guide, with more tasty morsels on CompuNet and Micronet

56 BUSINESS USER

70 BEGINNER'S BASIC

Part 2 — getting to grips with variables.

A look at the multi-purpose business program — Vizastar, plus all the business news

77 TOMMY'S TIPS

Our resident brain-box helps you out.

PEOPLE

Editor	Eugene Lacey
Deputy Editor	Bohdan Buciak
Staff Writer	Mike Pattenden
Design/Production	Lynda Skerry
Contributors	Chris Durham
John Ransley	Dan Gutman
Fred Reid	Tom Jeffries
Advertising Manager	Julie Madigan
Advertisement Executive	Julia West
Advertisement copy control	Josephine Collins
Publisher	Rita Lewis
Editorial and Advertising	01-251 6222
Subscriptions Back Issues	0732 351216

Registered Offices:
Priory Court, 30-32 Farringdon Lane, London EC1R 3AU.

Commodore User is published twelve times a year by EMAP Business and Computer Publications Ltd. Subscriptions and Back Issues are handled by B.K.T. Subscription Services, Dowgate Works, Tonbridge, Kent TN9 2TS. Telephone: 0732 351216.

Annual subscription (UK) £12.00, (Eire) £11.00, (Europe) £18.00, (Rest of the World) £32.00.

Printed by Garrod & Lethouse Ltd, Crawley; Photosetting and reproduction by Bow-Towing Ltd, London EC1.

Material is accepted on an 'all rights' basis unless otherwise agreed. Enclose SAE if you want the return of original manuscripts and photographs.

All material © copyright Commodore User 1985 and contributors. No part of this issue may be reproduced in any form without the prior consent in writing of the publisher, other than short excerpts quoted for the purpose of review and duly credited. The publishers do not necessarily agree with the views expressed by contributors and assume no responsibility for errors in reproduction or interpretation in the subject matter of this magazine or any results arising therefrom.

ISSN 0265-721X
1985 An EMAP Publication





THE ROTRONICS DR2301 COMPUTER/AUDIO CASSETTE RECORDER

The Rotronics DR2301 has all the facilities you would expect of a quality audio recorder and also works perfectly with the VIC 20 and CBM 64 computers without any fiddly separate boxes or adaptors. Simply connect the DR2301 directly with your Commodore computer via



the lead supplied and you are ready to start. The built-in interface circuitry ensures that SAVEing and LOADING is completely reliable – even when using commercially produced software. The DR2301 also allows the

computer to sense when the PLAYkey has been depressed.

Additional features are auto-stop, tape counter, in-built microphone and foldaway carrying handle. The DR2301 is also compatible with the ZX81, Spectrum

and many other popular home computers.

The DR2301 will take its power from the computer (Commodore only), mains adaptor (supplied) or internal batteries. Each unit carries a full 12 month guarantee.

Superb accessories for Commodore from Rotronics

THE ROTRONICS PORTABLE CASE

Here is the ideal portable work station for home, school or work. Specially made for most home microcomputers, it contains your VIC 20 or CBM 64 within a smart executive style case with removable lid for convenience in use.

The individually tailored foam insert securely protects your micro and cassette recorder (C2N or DR2301) during transit. Additional storage space in the lid holds manuals and up to twenty cassettes. A scalpel is provided to modify the insert for expansion units and an alternative

insert can be supplied if you change your hardware in the future. The case is also available with uncut foam inserts.

All components remain fully operational within the case via inter-connections routed between the double layers of foam, so there are no unsightly leads.

The case has been designed for easy use with each component positioned for convenient operation. The overall dimensions are 138mm x 725mm x 363mm. **ONLY £34.49 (p+p £2.50)**



ORDER FORM

Please send (enter as appropriate)

Rotronics Computer/Audio Cassette Recorder(s) at £36.95 each (inc. p+p). Rotronics Portable Case at £36.99 each (inc. p+p) for VIC 20/CBM 64* with C2N/DR2301* or Uncut Foam

Trade Enquiries Welcome

All prices inclusive of VAT

TOTAL £

I enclose a cheque/PO* for £ _____ made payable to SMT
 Debit my Access/Barclaycard* account no. _____

(*delete as applicable)

Signature

Name

Address

CU/2/85

Send to (no stamp required):
**SMT, FREEPOST, Greens Norton,
 Towcester, Northants, NN12 8BR**

Please allow 28
 days for delivery



SMT

VIC 20 and CBM 64 are registered trademarks of Commodore Business Machines.





NEWS COMMODORE IN VEGAS

I hope you're ready for World War II, 'cause it's about to happen. I just got back from the semi-annual Consumer Electronics Show extravaganza in Las Vegas, and I'll tell ya — Atari and Commodore are about to go at it again. Just like in the old days.

Seeing those two heavyweights face off at adjacent booths was almost as exciting as hitting my number at the roulette tables. And seeing old Commodore boss Jack Tramiel strutting around the Atari booth like he owned it (he always did, really) was like Ronald Reagan taking over as head of the Russian Politburo.

A few years back, you'll remember Jack let the Commodore Vic-20 and Commodore 64 loose on the world, slugging it out with the Atari 400/800 and 800XL. Jack and Commodore won World War I. Now we've moved to the next generation machines — computers with real muscles — and Commodore and Atari are going head to head all over again. I'm telling you, it's so exciting, my fingers are slipping off my Macintosh keyboard.

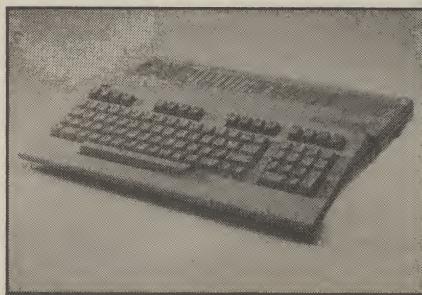
New machines:

But seriously, everybody I know just about fell off their chairs when we found out that the new Commodore 128 is going to be fully compatible with the Commodore 64. It's a miracle! They actually listened to us for a change. We can buy the 128 (that's 128K, of course) without having to junk all the software we bought for the 64. It's about time. Actually, we're getting to the point that these guys *have* to make their computers compatible. Tossing a Vic-20 in the trash-can wasn't such a big deal — the machine was practically a toy. But as computers get more powerful, people will refuse to dispose of them and buy a whole new system so easily.

C-128 revealed

Anyway, here's the specs on the C-128 (has a nice ring to it, doesn't it?). It's expandable to 512K, comes with 40/80 column switch, runs all CP/M software and all 6,000 or so 64 programs, is compatible with all 64 peripherals, has a nice 92-key keyboard with a 14-key numeric keypad, and eight programmable function keys.

Enough numbers, already. It sounds like the thing *cooks*. If Commodore can deliver the 128 when they promise (Spring in the States), at the price that they're hinting (under \$300), they may



The new C-128 — more memory than two elephants?

have another monster success on their hands. Long live the Commodore 64! They're already talking about cutting its price drastically when the 128 comes out. I should also mention that the 128 will have an optional mouse control and a new *FAST* disk drive — the 1571.

Lap-held Commodore

And there's also a really nice looking "lap" machine — the LCD Portable — which should be out soon in the States for just \$500. This one weighs just three pounds, has 32K, a built-in modem, and is compatible with all Commodore peripherals. It comes with built-in software too — word processing, file management, spreadsheet, address book, scheduler, calculator, memo pad, and communications software. What more does a guy want?

So what does Jack have to say about

A special report
from Dan Gutman

all this? At the Atari press conference, somebody asked Tramiel what he thought of Commodore's new machines and he said, "I didn't see any new machines!" What a comedian!

Jack put on quite a show of his own. The guy bought Atari just six months ago, and he's already got a truckload of products to show off. The most exciting was his 130ST and 520ST computers, which were immediately dubbed "Jackintosh." That's right. Jack must have sat down with his engineers and said, "I want a Macintosh and I want it cheap," because that's exactly what they gave him. The screen features movable windows, icons, pull down menus, and you control them all with the mouse. If that don't read Macintosh, I don't know what does. It even has a built in Breakout game.

More importantly, the thing is in colour (Mac is black and white) and the price is supposed to be between \$400 and \$600. I've been saying all along that if somebody could come out with a Macintosh for less than \$1,000, they'd sell millions of them. Now they have. Atari's only problem is that the ST line isn't compatible with anything in the known world, so there's no soft-

Commodore LCD portable for boffins on the move.





COMMODORE IN VEGAS continued

STOP PRESS

Commodore has slashed the price of the Plus/4 from £299.99 to a bargain-basement £149.99. Its action is a direct response to the £50 cuts announced just weeks earlier by arch rivals Sinclair and Acorn on the Spectrum and Electron. According to Commodore UK boss Howard Stanworth, the recent price war has "opened up a gap which we are moving fast to fill".

But there are other gaps: with Acorn's finances looking decidedly shaky and the BBC micro lying dormant in many dealers' shops, it's plain that Commodore intends to forage in the lucrative educational market. "The Plus/4 is exactly the right machine for schools and now offers better value than the BBC micro", says David Gerrard, Commodore UK marketing manager.

But does this mean the demise of the downmarket Commodore 16, which is now only £10 cheaper? "The C-16 sells as a complete Starter Pack. It's now the right product for the first time user", says Gerrard. "We don't assume the Plus/4 buyer is buying for the first time." Plus/4 production is being significantly stepped up at Corby, where over 100 redundancies were announced just after Christmas.

Shorts

Mini Office for Commodore: according to Database Software boss, Derek Meakin, the *Mini Office* business program has broken all records by selling more than some top-ten computer games. That's not surprising since the package costs a mere £5.95 on cassette yet consists of a wordprocessor, database, spreadsheet and graphics. There's also a 32-page manual — what more do you want? *Mini Office* is now available on the Commodore 64 and looks like selling just as well. Will it really help run your business? We're looking in to it. Database is on 061 456 8383.

ware for it yet. Commodore has a big leg up on them in that department.

Anyhow, it's a World War II soap opera, folks. Will Commodore whip Atari again? Or will Jack turn the tables on his old comrades and drive them to bankruptcy, as he nearly did to Atari last time? And what about Apple? Will they be forced to lower the price of the Macintosh in order to fight off the Jackintosh? Or will IBM march in and drive them all out of business? Tune in next time for the next bulletin from the front.

Don't wait for me, Amiga

Wait a minute. Aren't we forgetting something? What about the Amiga? For the past six months we've been hearing about this terrific computer that does everything but mow the lawn for you. It was nowhere to be seen at the Commodore booth, and they made no mention of it at their press conference (which was held at a restaurant owned by Liberace,

you should know).

I saw that thing running with my own eyes at the last CES six months ago in Chicago. It was in a private room at the Amiga booth — this was just before the whole company was purchased by Commodore. Are you saying the thing *still* isn't ready to show? What's taking so long? By the time they release it, it'll be obsolete!

Well, maybe Commodore didn't want to take the spotlight away from the 128, which really *is* an exciting development. You can't give the people too much good news at the same time. Don't be surprised if Commodore pulls off a surprise introduction sometime in the next few months. I'll keep my eyes open. See you next time!

• Great to hear about the new developments in the States. But when do the machines reach Britain? Commodore UK is being characteristically tight-lipped. So we'll just have to twiddle our thumbs for a while . . .

LOOK, WHO'S HERE

The BBC are extending their range of software to Commodore computers. Their text adventure *Dr Who and the Warlord*, previously only available for the BBC model B, will be released on the 64 in the Summer.

The game, based on a completely new plot written by an ex-producer, has two halves, each covering some 250 locations. The first part takes place on an unknown planet, where, to find the Doctor, you must outwit lurking androids and, worst of all, King Varaga's Blood Guards.

In the second part you are transported back in time by the Tardis to the Battle of Waterloo. To survive you must defeat not only Napoleon, but the evil Warlord himself.

Features of the game include real time, a help facility and the ability to save your last position and stop the clock if you need a teabreak. A Novaload system will enable you to get back into it as fast as possible.



"We caught her playing Jet Set Willy with the Tardis."

ROCKY HORROR



Dammit, Janet, we're in a computer game.

Calling all Transylvanian transvestite rockers! Yes, it's the software game of the film of the hit musical. The *Rocky Horror Show* from CRL is a completely graphic adventure.

Each screen of the adventure will be an illustration in its own right. The player will be able to adopt the persona of either of the two love-struck protagonists, Janet and Brad. You must save your partner from the perverted clutches of Frank N. Furter and escape from the Palace.

The Commodore 64 version will be released towards the end of March and will feature music from the show. So get ready to do the Time Warp. Don't be put off if you haven't heard of the *Rocky Horror Show* because CRL promise "... thrills and chills, romance with gorgeous gals and hunky guys". The *Rocky Horror Show* will sell for between £8.95 and £9.95 on cassette.

Shorts

Getting the hump: Ocean has resolved its differences with Software Projects over who has rights to the "Hunchback" character that's had Ocean laughing all the way to the bank. Software Projects has accepted Ocean's copyright and has agreed to licence the unfortunate rope-swinger for its new and bizarre title, "Hunchback at the Olympics". Olympic bell-ringing?

Shorts

New Addiction: Kevin Toms, boss of Addictive Games who wrote the successful *Football Manager*, has come up with yet another quest-for-success game, this time called *Software Star*. Your aim is to steer your software house along the precarious path to success, making the right decisions and solving inevitable problems. The Commodore 64 version costs £7.95.

Shorts

16 and Plus/4

compatibility: Already two companies have thwarted Commodore's malicious aim to make Vic and 64 peripherals incompatible with the new C-16 and Plus/4 machines. Impex Software has produced a plug adaptor, costing £2.25, that permits any joystick with the 9-pin 'D' plug (used by the Vic and 64) to fit the new machines. The same type of device, more expensive at £4.45, is also being sold by Euromax Electronics, which goes one step further by offering a Commodore Datasette adaptor, costing £5.25. More details from Impex on 01-900 0999 and Euromax on 0262 601006.

Shorts

Bridge that gap: Alligata has announced that it is to launch an improved version of its *Contract Bridge* game for the Commodore 64. For those of you who've got the old version, Alligata will exchange a new one for a mere £1 handling charge. The new version is called *Bridge 85* and sells for £9.95 (tape) and £11.95 (disk). Details on 0742 755796.

Commodore means business?

Whilst people flocked to see Commodore's new 'home' computers at CES in Las Vegas (see page 5), a little less attention was grabbed by the new Commodore Personal Computer, displayed for the first time at the recent 'Which Computer?' Show. Despite its mammoth success with smaller machines, Commodore still lusts for a share in the 16-bit business market, which has already been stitched up by the IBM PC and the 'PC clones'.

The usual reticence pervaded Commodore's stand but a few snippets were to be gleaned: the PC (surprise, surprise) will be "100 per cent IBM compatible", it uses an Intel 8088 processor (made by Commodore under licence) and has two half-height 360K disk drives — nothing special there. There's also space in the (rather large) system box for a Winchester.

No prices and no dates for availability yet, though. But according to Commodore marketing manager, David Gerrard, it will be a case of "the latest technology at the most



The Commodore PC, hoping to take a bite out of the 16 bit business market.

competitive price". A few people seem convinced, anyway. Gerrard reports that Northerner, Norbrain and STC have already signed distribution deals.

SOFT-AID GAMES FOR ETHIOPIA

Several leading computer games firms have banded together to do their bit to raise money for Ethiopia by producing a compilation tape of computer games — called Soft Aid.

The project is being co-ordinated by Quicksilva boss — Rod Cousens, who has so far signed up an impressive list of games to go on the tape. Quicksilva themselves are donating *Ant Attack*, and *Fred, Fantasy* are to donate *The Pyramid*, *Falcon Patrol*. Also on offer are *Sorcery* from Virgin, *Kong* or *Hunchback* from Ocean, and *Gum Shoe* from A&F.

Other companies still to announce a title are Beyond, Melbourne House, Psion, and U.S. gold.

The tape will be recorded on both sides and will retail at £9.95, initially only for the Commodore 64 and Spectrum 48K.

Rod Cousens told the User: "We have spoken to Bob Geldof of Band Aid and he is all for it . . . we are hoping to get Bob's help to promote the tapes."

W.H. Smith have agreed not to charge their

normal mark-up on the tape, and several magazines, including *Commodore User*, have agreed to run advertisements for the tape free of charge.

Commodore are organizing their own fund-raising campaign for Ethiopia. Each new 64 sold over the Christmas period contains a guarantee card. For each card returned Commodore have pledged to donate 25 pence.

A spokesperson for the company said that the £10,000 target Commodore had set themselves had been reached.

One of the computer games business trade journals — Computer Trade Weekly — has launched a fund raising campaign by asking software houses to donate £500 each. The fund currently stands at £4,700 and will receive a further boost when proceeds from Gremlin Graphics latest game — a children's adventure called *Tinder Box* — are donated to the CTW fund. Cheetahsoft are also to donate profits from their *Perils of Bear George* game to the Ethiopian Famine Appeal.

MAKING SPEECHES

A new speech synthesiser for the Commodore 64 is being produced by Cheetah Marketing, despite the fact that Currah Computers, who first marketed a similar device called Speech 64 have now gone bust.

Like Speech 64, the Speech Synthesis Module from Cheetah uses the allophone method and sells at a similar price, a little under £30.

How do Cheetah expect to avoid the same fate? According to a spokesperson, Currah got their sums wrong and over-produced. Cheetah are more confident because they have similar products available for the BBC

and the Spectrum and they are reportedly selling well. Advance orders are already in the bag with some major distributors.

But hold, the Currah Speech 64 module will not lay down and die. Welwyn Systems, its manufacturer, has just announced it is to market the product directly. And they've got Steve Currah, erstwhile founder of Currah Computers to join their U.S. office in Boston.

To confuse the matter further, DK' tronics has announced that it will be manufacturing and marketing the device, having gained the rights after months of negotiation with the receiver.



PROFILE: BRUCE CARVER

This month we introduce another new series: *Programmer Profile*. We kick off here with a look at the idiosyncratic talent of American, Bruce Carver, whose Access games are riding high in the software charts.

Bruce Carver's Salt Lake City home is a long way from the barbed wire of the Iron Curtain — though the Soviet menace is never far from his mind.

"I believe the Soviets intend to spread their influence around the globe... witness Afghanistan." Not a surprising view of world politics from a practising Mormon who describes himself as a "right wing republican" and is the author of the controversial, and brilliant, *Raid Over Moscow*.

Raid assumes that there has been a world agreement to abandon nuclear arms. But the sneaky Soviets retain some of theirs and let fly with a volley of nukes at key American cities. It's up to you to save Uncle Sam at the controls of the sophisticated Stealth Bomber — launched from a Star Wars space station. Your mission is to fly undetected to the Russian missile bases, destroy them, and fly on to Moscow to knock out the Soviet defence centre in the Kremlin.

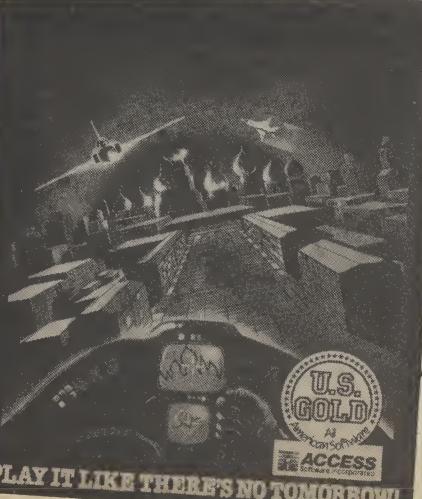
Carver has answered his critics — amongst them are W.H. Smith who refused to have *Raid Over Moscow* on their shelves. "I don't apologise for it... We believe it's a very believable scenario." "If they could take over without a World War III they would," he adds.

Politics aside — anyone who has played *Raid Over Moscow* will know that it is a good game in its own right, irrespective of the, to some, distasteful scenario. And talking to Bruce Carver you get the distinct impression that he is more interested in computer games than in American-Soviet relations.

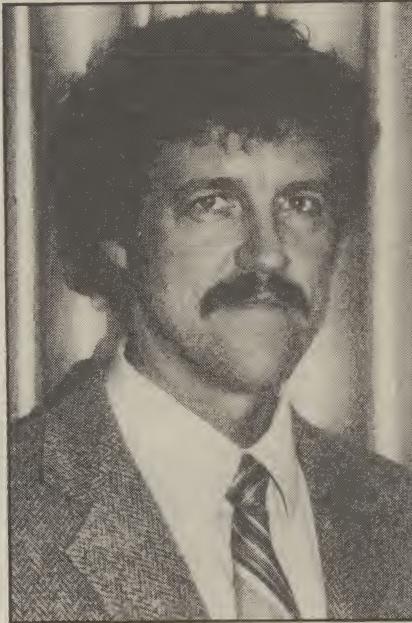
Raid over Moscow: Hot software for the Cold War.

commodore 64

RAID OVER MOSCOW



PLAY IT LIKE THERE'S NO TOMORROW!



Bruce Carver: Do Mormons and missiles mix?

He needs to be — running one of the most successful smaller game houses in the intensely competitive American software business. "We don't have the resources to spend on massive advertising campaigns... our games stand on quality" ... "Beach-Head and *Raid Over Moscow* took four months each to program, six day weeks, ten hour days" ... "sometimes when I'm working on a program I wish that I could bunk off, or go skiing, but I know I've got to stick at it," says Carver.

The evolution of a Bruce Carver game is akin to the development of a film, or play, rather than what you expect from a computer program.

Just like a film director, Bruce starts off with a detailed storyboard — a sketch of all the game screens showing all aspects of the game-play. Next stage is to produce a computer graphics storyboard — this is done using a Koala Pad — though the pad is not used for the game's final graphics.

These are programmed from a third storyboard drawn by Access artists on to a specially designed grid which defines each graphic pixel by pixel. Graphics are all important in Carver's games: "I guess I am something of a frustrated artist". Again borrowing from techniques developed in the film world Carver makes models and photographs them in various positions to

provide a blueprint for the animation. This is how the impressive aircraft carrier bombardment scene from *Beach-Head* was developed.

The war theme, started in *Beach-Head* and carried on in *Raid Over Moscow*, will also be the subject of the next game from the Carver keyboard — *Beach-Head II*. This could well be the last of the big guns games though as Carver is anxious to look at something completely different for his next game.

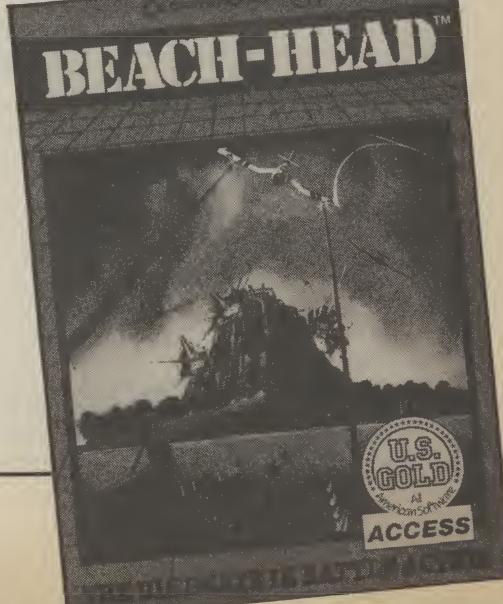
When asked to name his favourite games Carver is quick to point out, "I prefer programming to playing the games. By the time an Access game is complete I know it so well — all the possibilities — that playing it is the last thing I want to do..."

"I play other people's games, the head to head variety are my favourites, games like *Intellivision Baseball*, *One on One*... I also enjoyed *Ghostbusters*, especially having seen the film six times, and the new Epyx game — *Impossible Mission*."

And the future of computer gaming? "The games will be around for ever — but not at the rate they are being launched today. People are now realising that there is more to be done with a computer and they will begin to look for software that will help them realise their own creativity," says Carver.

Bruce Carver's Access Software has bucked the trend in the US that the games market is controlled by a dozen or so enormous software houses. Beach-Head I and II, and *Raid Over Moscow* are distributed in the UK by U.S. Gold.

Beach-Head, the Falklands were never like this.



INDIANA JONES

in the

LOST KINGDOM

TM*

TM*

The artifact is just too tempting. Sure, no one has ever returned with it but they didn't have your brains and courage.

This treasure is worth any risk. An artifact containing the total history and knowledge of a lost, forgotten civilization! Just think what that could do for your career, for the university museum, and for your bank balance!

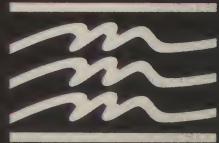
Of course, there is the small matter of finding it. The perils en route are sure to be the most fiendishly clever traps and puzzles you've ever faced. You'll need all your skill and daring just to survive.

Then there's the ancient curse... but what the heck; if it were easy, it wouldn't interest you.

Dr. Jones - would it?



Distributed in the U.K. by U.S. Gold Limited,
Unit 10, The Parkway Industrial Centre,
Heneage Street, Birmingham B7 4LY.
Telephone: 021-359 3020.



MINDSCAPE

It's a range of top quality software from Commodore designed to make the most of your Commodore 64's capabilities.

New packages will be introduced to the Gold Medallion range every so often, but only if they are really exceptional. They'll definitely be hard to beat.

Miss any of them, and you really will be missing out.

MUSIC MAKER

Whether you're an accomplished musician or an out-and-out beginner, Music Maker strikes exactly the right note.

No matter if you've never played a note before, so long as you can hum and you know your ABC, you can start to play famous popular tunes immediately.

And it won't be long before you appreciate Music Maker's many advanced capabilities: you can synthesise many

musical instruments, even create your own 'synth' electronic sounds, choose between monophonic or polyphonic play, summon up pre-programmed rhythms and bass accompaniments, and more.

Music Maker is the first in a series of packages which will fully exploit the Commodore 64's outstanding musical capabilities.

On disk or cassette, with music keyboard, a clear and concise manual, and song book, for just £29.95.

SPIRIT OF THE STONES

It's a treasure hunt for 41 real diamonds hidden somewhere on the Isle of Wight.

Only one man knows where they are, and he's not saying.

All that he has to say he's said already -



GOLD IF YOU HAVE IT

but in the form of riddles, clues and puzzles.

Solve the puzzles in the Spirit of the Stones program and you'll find it much easier to solve the puzzles in the Spirit of the Stones book.

Solve the puzzles in the book and one (or more) of the diamonds can be yours.



Whoever discovers a diamond can also claim his or her share of the Royalty Fund, which could grow to a maximum of £1 million. It's a game that's as entertaining as it can be rewarding.

On cassette or disk, £14.99.

INTERNATIONAL FOOTBALL

Already it's recognised as the best football game ever seen outside of Wembley.

It's startlingly life-like, and gives you near perfect control of the players.

You can kick the ball, dribble it, pass it,

MEDALLION. HAVEN'T GOT IT HAVEN'T GOT IT.

head it or even throw it in from the touch-line. And every time you belt the ball into the net, the crowd cheer wildly.

How often you score depends on how good you are, and also at what level you choose to play.

There are 9 levels you can play against the computer. Or you can play a friend.

International Football is a real test of skill, dexterity and speed. It is certain to drive you football crazy.

On cartridge, £14.99.



JACK ATTACK

There's no other game like it. It has been voted by the U.S. magazine 'Electronic Games Hotline' as a 'must buy'.

Jack Attack is about squashing heads. It's an



addictive game, a game of strategy and cunning. We can almost guarantee it will turn you into a head-case.

To stay alive, Jack must leap aside from collapsing bridges and crashing blocks, and at the same time he must

make sure he doesn't fall into the water... and drown.

And that's the easy bit. Because everywhere Jack goes he's dogged by jolly bouncing sadistic heads that are out to nut him.

He has to squash their heads before his is squashed.

And Jack can't afford to lose his head because we've only given him three, and when they've gone, he's gone...

Jack Attack is available for both the Commodore 16 and Plus/4. On cartridge £14.99.

commodore
HARD SOFT TO BEAT



TAKE THREE TABLETS...



Main pic — Super Sketch has winged its way across the Atlantic courtesy of Stonechip Electronics.

Below — Super Sketch uses an on-screen 'menu' system which displays drawing options down the left side of the screen — and the menu can be cleared to display the whole screen.

Drawing tablets for the 64 reviewed

Last month we looked at drawing and graphics software for the 64, which are controlled either by joystick or keyboard. But you might prefer to draw on a flat surface with a real pen or stylus, using one of the digitising drawing tablets now available. The only problem is that they're rather more expensive. Valerie Buckle has looked at three current offerings: the now-established Koala Pad, the newer Touchmaster, and the latest to arrive, Super Sketch. **By Valerie Buckle.**



A graphic art package is simply a piece of software that lets you copy or design pictures on your screen without needing to write a program. They all use either keyboard, joystick or lightpen to control the cursor. Digitising drawing tablets are more sophisticated because they let you draw on a flat surface with a stylus whose movements on the board control the on-screen cursor.

So how does a digitiser work? It's a flat board capable of transmitting to the computer the position (x, y coordinates) of the stylus on its surface. But there are differences in the way each package both senses and transmits that information. All three use multicolour mode which gives 16 colours, uses up to 9K of memory and allows four colours in each 8 by 8 bit character square. So let's load up the first device.

KOALAPAD

The KoalaPad, from Audiogenic, costs £79.95 and is already well-respected by professionals and amateurs alike. It consists of a small digitising tablet, stylus, cartridge containing the KoalaPainter program and two manuals. Newer versions of the program come only on disk or cassette. The tablet is well-designed, being slim and light, and houses a touch-sensitive pad on its surface which means that younger artists can use their fingers as a stylus (although this results in a considerable loss of accuracy). The two pushbuttons on the top of the tablet control the operation of the program. So, to use the KoalaPad, you merely plug it into the joystick port 1 and off you go.

The title screen of KoalaPainter is replaced swiftly by the main menu which displays the various functions

with small, labelled icons. To choose a function, you simply move the stylus to the preferred icon (the stylus is indicated on the screen by a small arrow) and press either button. The menu includes all the major functions, brush options and colour palette. A choice of eight brush styles is available, including a combination of five pixels which produces spectacular effects on the screen. The palette contains sixteen solid colours mixed with the current foreground colour.

This appears to be an attempt at colour mixing and, as such, is not of the same high standard as much of the rest of the program. The main problem is that the blocks of colours suffer from the effects of chroma distortion which results in vertical stripes down the mixes. (This could have been overcome by using horizontal stripes instead of chequering.) Apart from this, KoalaPainter handles the low colour resolution in multicolour mode extremely well and any colour changes can be checked using zoom mode.

Start drawing

To begin drawing with KoalaPad, you simply depress one of the buttons while moving the stylus around the surface of the tablet. Drawing is terminated by releasing the pressure on the button. As the area used for drawing is rather small, slight movements of the stylus create many dots so the draw mode does not, unfortunately, prove to be very accurate.

However, this is easily overcome by using the superb Zoom mode for editing. This allows you to magnify a specified rectangle of the design on the lower half of the screen. It would have been nice to have a fully scrolling Zoom feature but, by moving the cursor to another part of the picture on the actual size portion, the zoom will shift to magnify the new area.

KoalaPainter has most of the other commands you would expect from a graphics package of this price including Mirror, Circle, Fill and Line. But it is the extra thought that has gone into the programming which makes this such a joy to use.

I particularly appreciated the transport feature which enables you to set the size of Circle, Line, Disc, Box and Frame, stretching them like a piece of elastic until you are happy with the effect, and then move them around the screen before eventually fixing in place with a push of one of the buttons.

Seeing double

Two drawing screens are available and the Swap command allows you to toggle between the two. The Copy feature makes it possible to transfer a

shape or design from one screen to the other, and, most importantly in my view, it doesn't copy the background colour. Most systems simply copy a rectangle of pixels but this feature allows you to copy an arbitrary shape.

Another well-designed feature is the very fast Fill routine. The Oops command will cancel the last command, of particular use for breaking into an unwanted fill (most other packages lock the peripherals out during the fill process). Storage and retrieval are adequately explained in the manual and present no problems.

A Basic program is provided for LOADING and displaying pictures from disk which have been created with KoalaPainter, so budding games programmers can create their own games using this package. To use the digitiser directly from Basic, all that is necessary is to PEEK the X and Y values from the analog-to-digital converters on joystick port 1. (Note that only 8 bits are available from specifying each axis hence the horizontal resolution of the digitiser is less than that of the bit-mapped screen.)

Conclusion

Overall, KoalaPad is easy to use, being entirely cursor menu driven, you can sit in your favourite armchair and create masterpieces in comfort. It's expensive but represents good value for money. My only real criticism is of the lack of printer dump although the new versions do have this facility. I would recommend this product to both the occasional user and the more committed graphics expert.

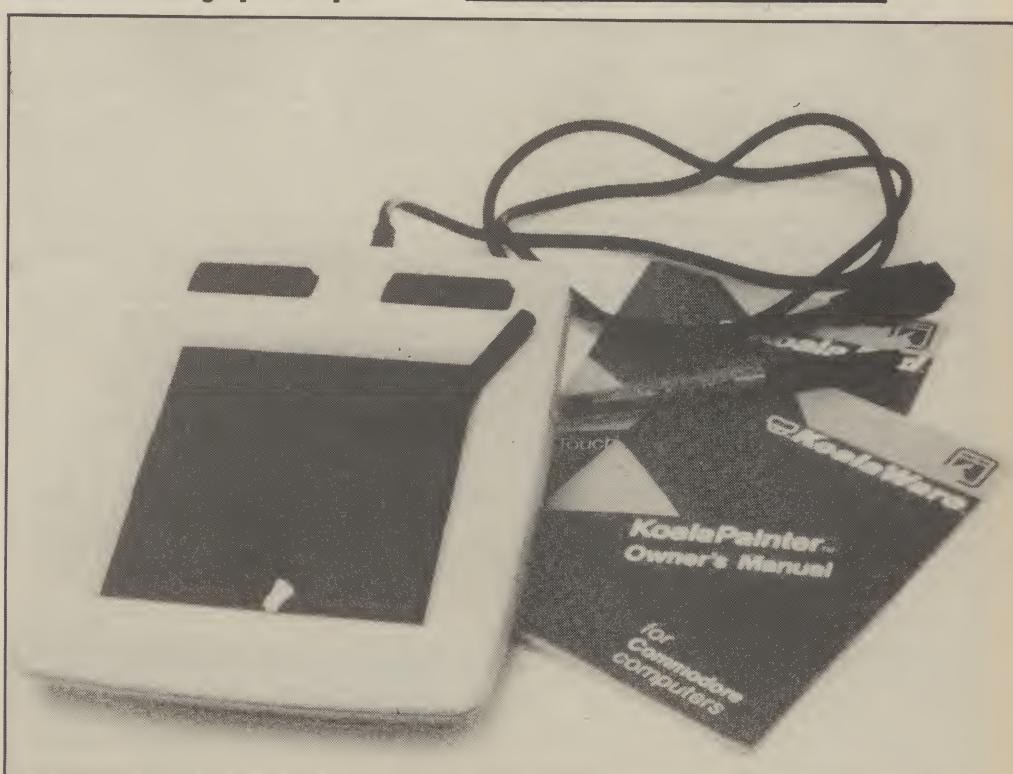
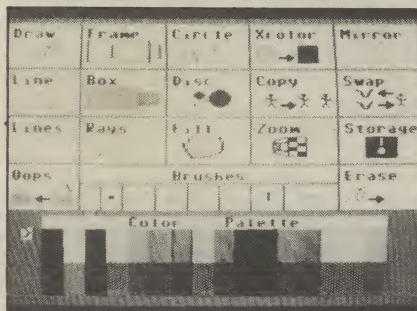
TOUCHMASTER

Touchmaster is much more expensive at £149.95. I was initially impressed by the size and design of this tablet. A4 in size, Touchmaster has a pressure-sensitive surface with a plastic overlay which has the control areas located at the right-hand side: the rest of the surface is the drawing area. Also included in the package are a power supply, stylus, interface, manuals and MultiPaint software.

Two problems confronted me on loading up: the manual refuses to tell you which way round to insert the interface into the back of the 64, then I couldn't load the graphics software from cassette using the commands in the manual. Although the correct name is obvious from the information which appears on the screen, this kind of fault is inadmissible in such a pricey package. Not surprisingly, I was by this time a little sceptical of the claims in the blurb, and, I'm afraid to say, the rest of my

The main menu on KoalaPad displays the various drawing functions with small, labelled icons.

The highly successful KoalaPad package is distributed in the UK by Audiogenic. Its drawing software comes on tape, disk or cartridge.





experiences with Touchmaster did not change my first impressions.

Like KoalaPad, Touchmaster is entirely cursor menu driven, the difference being that with Touchmaster the controls are displayed on the overlay that fits over the tablet. Pressure from the stylus on the overlay allows you to select from a large range of graphics commands and your current choices are displayed on a line at the top of the screen.

Brush strokes

The three foreground brushes can be used in a wide range of styles although none appealed to me as much as the styles available with KoalaPad. Brush widths can also be changed although I did not find a great deal of difference despite the fact that there are nine choices. The standard sixteen colours are available, but there's no attempt to mix the colours, nor are there any patterns provided. The range of brushes allows you to draw reasonably complicated designs but you must remember that you can only use each paintbrush once in each character square or you will see the colours changing before your eyes.

Touchmaster has most of the options you would expect such as a fast Fill, two types of Circles, and a sophisticated Polygon routine which draws shapes of three to nine sides. The Draw command suffers from a lack of accuracy which rules out using this program for anything more than entertainment. Furthermore, the shape commands are not elastic as in KoalaPad and I found it quite difficult to set suitable ranges with no guidelines on the screen.

The one command I found particularly strange was Zoom. Normally one of the most useful features of any graphic art package,



The Touchmaster pad features an impressive drawing surface but it's the most expensive device under review.

Touchmaster will let you draw the usual variety of shapes and also permits text to be incorporated in your designs.

this command appears to blow up the most recently drawn design and overlays it at the current cursor position. Confused? So was I! The manual doesn't explain this and experimentation is the only way to fully understand this and most of the other commands. There is, however, a very useful Text mode which allows you to type in text from the keyboard on to the screen in any colour.

Load and Save

Load and Save facilities on Touchmaster are simple to use although, as with earlier versions of KoalaPad, there is no printer dump facility. Using the program provided in the user manual, the digitiser can be used from Basic to create your own drawing program, for example. The software interface between the digitiser and the Commodore 64 is quite complicated. To sample a single coordinate pair five PEEKs and ten POKEs are necessary. Serious use of the Touchmaster package is limited by the fact that designs can only be LOADED back into the Touchmaster program.

Conclusion

To sum up, I was not impressed by Touchmaster. The manuals proved to be misleading, if not incorrect, and the MultiPaint documentation is inadequate. The tablet itself is comfortable to use and I'm all in favour of alternatives to keyboard control but this must be backed up with software of a good standard, particularly at this price. Touchmaster do advertise a large range of accompanying educational software (Touchware) which will, no doubt, broaden its appeal. When compared with KoalaPad, Touchmaster is poor second best, no recommendation at this price!

SUPER SKETCH

Super Sketch emanates from the American Personal Peripherals Inc. It costs £59.95 and is imported by Stonechip Electronics. It's a mechanical device in which the stylus is connected to a pair of potentiometers, effectively communicating its X and Y coordinates to the computer. Despite looking cumbersome, it was found to give a greater degree of accuracy than the electrical system used by the other two packages.

The package consists of the tablet, manual and starter kit and Graphics Master art program on cartridge. The tablet is made of a scratch resistant plastic, the lower part of which is the digitising surface (slightly less than A4 in size) over which the stylus is moved by means of a handle connected to the control arm. The arm passes through a box containing the two potentiometers and associated electrics. Five chunky push buttons on the top of this box control the system.

Instructions for connecting up the tablet (via joystick port 1) and graphics program to your Commodore 64 are fully covered in the manual which also explains most of the features of the software very comprehensively.

Getting started

Switching on the computer, you press the menu button on the top of the tablet to gain access to the main menu. This appears on the left hand side of the screen, leaving most of the drawing area visible. The main menu contains several standard commands such as Clear screen, Draw, Erase, Oops and Fill (fast but not perfect), as well as housing the colour palette and commands to access the more advanced menus.

To initiate any of these you simply move the cursor up to the chosen command by moving the pointer and press the Select button on the tablet. The Lift button allows you to move the control arm around the screen.

without drawing. I found the control arm easy to manoeuvre and the position of the stylus is conveyed with surprising accuracy.

In a convenient corner of the screen a small box continuously shows an expanded area around the current cursor position (Zoom). A unique feature of all the Graphics Master commands is the buffered input from the digitiser. This means that if the software cannot keep up with the stylus it will catch up afterwards rather than losing part of the drawing — very clever.

Choose your colour

The standard sixteen colours are available from the main menu and the current colour chosen is also the border colour. But full colour mixing is also possible with Graphics Master. By choosing the Design option from the main menu, one user-defined and eight preset patterns are available for use with Fill and Draw, for example. By selecting two colours with the same "grey-level" on alternate horizontal lines an intermediate hue may be obtained with none of the problems of chroma distortion.

For example, mixing red and blue gives a wonderful deep purple not otherwise available. Similarly, one user-defined and eight preset brush styles can be used to paint either in solid colour or textures.

A further "Expert" menu gives elastic Lines, Rays, Boxes, Circles and ovals. As with KoalaPainter, an elastic box can be used to define an area of the screen to be copied elsewhere, and the background remains invisible. Another similar feature is the availability of two drawing screens and the ability to copy between them. Mirror functions allow various axes of symmetry to be defined giving kaleidoscopic effects. The Window command defines an area of the screen outside which drawing is inhibited.

The most remarkable thing about all these functions is that the majority can be used simultaneously. For instance, a large paintbrush can be used to draw in any pattern using elastic lines or circles with the Window and Mirror modes on. Most packages of this kind just do not allow such sophisticated stuff. All designs may be saved on to disk or cassette but there are no facilities available for using your pictures with your own programs or dumping to a printer. One wonders what one should do with them? The manual explains most of the features in adequate detail but I feel that more specific information should have gone into the section on colour mixing.

Conclusion

Superb software and good design

makes this package excellent value for money. The lack of a printer dump is infuriating in an otherwise outstanding package but I would recommend this to anyone with an ounce of imagination and a few pounds to spare.

KoalaPad
AudioGenic Ltd
0734 664646
cartridge/disk/cassette
software
£79.95
easy to use and good value

Touchmaster
Touchmaster Ltd
0656 744770
cassette software only
£149.95
disappointing for the price

Super Sketch
Stonechip Electronics
0252 333361
cartridge software
£59.95
recommended

POWERFUL UTILITIES FOR YOUR "64"

THE BEST RANGE OF UTILITIES FOR THE 64. WRITTEN BY PROFESSIONALS—SOLD BY PROFESSIONALS

Two important NEW programs

QUICKDISC Incorporating Menu Maker

Speed up your 1541 disc drive with this new program. Loads most programs at **more than double** the normal speed. A flexible package that allows you to incorporate a **menu and fast loading on your own discs**. Also includes a file exchanger for programs put on disc with "Disco" (THE tape to disc utility), another way of making fast load disc programs. A **must** for all disc drive users.

ONLY £11.95

DOUBLER Tape Back Up Device

Includes **hardware and software**. This **amazing** new cassette port adaptor allows you to make back up copies of "turbo" software. Tests have proved **100% successful**. Requires access to two cassette decks. The special software generates a **brand new machine copy** onto one deck while loading from the other. **Fast and reliable**, they said it couldn't be done.

ONLY £12.95

FASTBACK Fast Load Utility

Convert your slow loading software to **high speed load** with Fastback. The **most sophisticated** program of its type allows you to produce "turbo" loading versions of most single and **multipart** software that load **independently** of Fastback. **Simple to use no programming skill needed**. Example: Load "The Hobbit" or "Manic Miner" in **150 secs**. Tried and trusted (over 2000 sold).

A **very professional program**.

ONLY £9.95

DISCO

THE TAPE TO DISC UTILITY
We **guarantee** that this is the **best** tape to disc utility on the market. **Very easy to use no programming knowledge needed**. Automatically handles device numbers and multi part programs. Programs **auto-load** and **run** once transferred and can also be made to **fastload** with **Quickdisc**. Handy for making your own disc programs auto run.

ONLY £9.95

DISC DISECTOR

At last a **really powerful** disc copier and utility program. Incorporates a range of powerful programs. Includes "Fastcopy" takes just **four minutes** to read and write a **whole disc**. "Error copy" automatically reads and writes **all** error types, now you can make a security back up of those expensive business programs. "Quickdisc" more than **halves** disc loading time, **very useful**. "File copier" allows **selective** copying from directory. "Track & Sector" a slower but very thorough program. Also includes the following useful utilities. **Menu maker**, **Index**, **Retitle**, **Rename**, **Scratcher**, **Disc to Tape** and **Tidy**. If you have a 1541 you **must** have Disc Director. Supplied on disc with full instructions.

ONLY £29.95

COMMODORE CONNEXION

Connect **any** "Centronics" type printer to your '64. Price includes lead and software on cassette with special disc conversion program.

Simple to use and very reasonably priced.

ONLY £14.95

ROCKET

Fed up waiting for programs to load and save? Rocket is a utility for the programmer, speeds up loading and saving by about **8 times** while still allowing for normal speed operations. **Does not** affect the speed of BASIC as no wedge is used. Programs can also be saved with high speed system to **reload independently**. A must for serious programmers who have no disc drive.

ONLY £7.95

BIGMOUTH

The **superb** new **speech synthesis** program for the '64. Uses "speak" as a basic command. **Very easy to use**. Can be incorporated into your basic programs. Words are entered in phonetic English, i.e. spelt as they sound. Therefore vocabulary is **unlimited**. **Great fun** and good for educational purposes.

ONLY £7.95

TAPER

A powerful utility. Works with almost all normal speed software.

ONLY £5.95

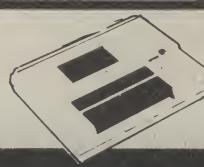
**3M SCOTCH
DISCS
S.S.D.D.**

£16.00

LIFETIME
GUARANTEE
BOX OF TEN



MICRO CENTRE
BRIDGE STREET, Evesham,
WORCESTERSHIRE
Tel: 0386 49641



DATA RECORDER
A dedicated data recorder designed for use on the CBM 64 or Vic-20. Specification as C2N but with **pause button**. Model available for the PLUS4 or 16 at same price.

SATISFACTION GUARANTEED.
ONLY £29.95

MICRO CENTRE
1756 PERSHORE ROAD,
COTTERIDGE, BIRMINGHAM.
Tel: 021-458 4564

HUGE RANGE OF SOFTWARE & BOOKS FOR BBC, ELECTRON, SPECTRUM, COMMODORE 64, VIC 20, ORIC, DRAGON, MEMOTECH & ZX 81

Trade and Overseas Orders welcome.
All prices inclusive. Send Cheque, P.O. Bank Draft or phone your Card Number to 0386 49641.

YOU AND YOUR COMMODORE 64

Organise your life for the next eight years with your personal electronic diary



**Desk Diary £29.95
(disk + manual)**

Have you ever wished you had a Diary which you could alter at will to suit your requirements year after year? If you have then DESK DIARY could be the Diary you've always wanted.

DESK DIARY is a powerful Diary Information Management System. It features Powerful PASSWORD protection for the entire DIARY, MENU driven routines and well defined screens.

With DESK DIARY you can:

- Protect your Diary from unauthorised entry
- Enter your Appointments and Engagements for any date up to 31.12.1992 and enjoy powerful search and edit facilities
- Record important dates, text and any other information at any time, e.g. your tax details, your professional advisers, events and their dates which are important to you
- Access your recorded information with powerful search and edit facilities
- Leave a MESSAGE for another authorised DIARY user
- Study the dates of a calendar month in any calendar year from 1983 to 2057
- Read ANY Data File which has been created by EASY SCRIPT and EASY FILE
- Prepare ANY of your DESK DIARY Data Files to be read by EASY SCRIPT
- Initialise your Disks, make copies of your Data Disks, Delete entire Data Files, Rename your Data Files

Send for your own Desk Diary NOW.

Produced by the software team that designed and developed EASY FILE

These software programs will be supplied with the benefit of a six month guarantee but subject to the terms of such guarantee which are available on request.

To: Associated Services (London) Ltd., 23 Chesham Street, London SW1X 8NQ.
Telephone: 01-245 9522

Please send me the following software PRODUCTS (Disk + Manual):

DIGITAL LAB _____ copy/copies at £30.95 each (£29.95 + £1.00p + p) £ _____

DESK DIARY _____ copy/copies at £30.95 each (£29.95 + £1.00p + p) £ _____

TOTAL £ _____

I enclose a cheque/Postal Order for £ _____

Please charge £ _____ to my credit card (specify card) [Access/Mastercard//Visa]

Card No.

Expiry date _____ Signature _____

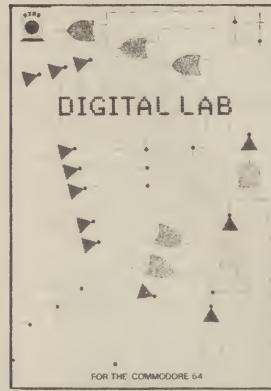
Name _____

Address _____

Post Code _____

CU3

Stay ahead with your ideas for designing logic circuits with this ingenious software program



**Digital Lab £29.95
(disk + manual)**

DESIGN your own LOGIC CIRCUITS using AND Gates, OR Gates, EXCLUSIVE OR Gates, INVERTER LINKS, Simple LINKS, ANGULAR LINKS, TAPPINGS and JUNCTIONS with this ingenious Software Program.

DIGITAL LAB is a powerful program which performs various functions of a LOGIC LABORATORY. With DIGITAL LAB you can design and construct your own LOGIC CIRCUITS. You can select any LOGIC ELEMENT and LOGIC LINK from a comprehensive set of MENUS. DIGITAL LAB will check the validity of every LOGIC GATE and LOGIC LINK in your CIRCUIT. It will analyse your LOGIC CIRCUIT and the results of its analysis will be displayed in a TRUTH TABLE with the corresponding Boolean Expression.

DIGITAL LAB contains many other features and UTILITIES which are very useful to such an Application including a set of Disk House Keeping UTILITIES which allows you to FORMAT all your Disks, make copies of your Data Disks, DELETE entire Data Files and RENAME your Data Files.

DIGITAL LAB is a unique tool for pupils, students and anyone else who would like to extend their practical approach to Designing and Constructing LOGIC CIRCUITS. With the use of DIGITAL LAB understanding LOGIC CIRCUITS is made easy and you can enjoy the atmosphere of a LOGIC LABORATORY in the comfort of your own home.

DIGITAL LAB is easy to operate and will help to provide a clear understanding of Boolean Algebra with reference to LOGIC CIRCUITS. It is written in Commodore 64, 6502 Assembly language and is fast in its operations.

Send for you own Digital Lab NOW.

C16 SOFTWARE SUPPORT

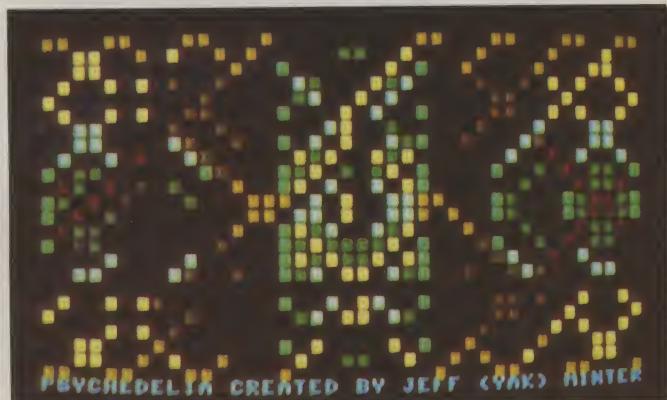
by Mike Pattenden

When it was launched last summer as a replacement machine for the Vic 20, the Commodore 16 met with a mixed reception. Grumbles were heard about its limited memory, lack of sprites and poor sound capabilities. One of the main reservations was the lack of software support. Is it a dead duck? We asked software houses what they thought and compiled a list of what they had on offer.

Despite the apparent shortcomings of the Commodore 16 the machine has been selling well, even better perhaps than Commodore themselves had imagined it would. Sales they say, with customary reticence, have been "very substantial", and reportedly in six figures. Independent sources estimate the 16 user base slightly lower than this — approximately 90,000. However many have been sold one thing is pretty clear about this new computer — there aren't many games for it yet. If you are a C-16 owner you may be sitting there twiddling your thumbs and wondering whether you've bought a white elephant?

Well, rest assured, you haven't, though it may be a while before the market is as competitive and the quality is as good for the Vic and 64

Flight 737: Anirog's flight simulator has six levels of skill.



Psychedelia: Jeff Minter's dazzling light-show.

as it is now. Though one or two C16s have been seen in the classified ad pages. Some people have clearly run out of patience with it already. One of the main reasons for this are the doubts the larger software houses are expressing in the machine. K-tel, US Gold, Activision and Virgin all

have no plans to release any C-16 software at the moment. They feel there are more pressing priorities, the Atari 800 for example.

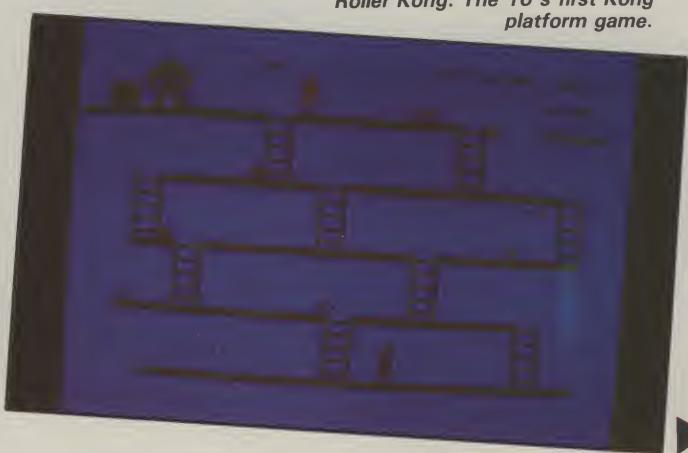
Expressing doubts

Gordon Reid, former software development manager and now

production manager with Creative Sparks, voiced some of their doubts: "A 16K machine in this day and age is a shame, it could have proved much more competitive". Having said that, his company are covering themselves with a couple of converted Vic titles. This seems to be the case with many other companies who have personal doubts about the machine. Micropower, for example, consider the machine "badly thought out", but are considering putting some titles out all the same.

Alan Hobbs, sales and marketing manager with Microdeal: "people are having to set their reservations to one side. The sales have made them think again. Even if sales don't last, there are enough owners out there to warrant

Roller Kong: The 16's first Kong platform game.



ANIROG

*The Name
For Quality
And
Innovation*

Flight Path 737



ADVANCED PILOT TRAINER

Written by a flight simulator instructor and pilot.
Superb graphics. COMMODORE 64 VIC 20 16K £7.95

TRADE ENQUIRIES: ANIROG SOFTWARE LTD. 29 WEST HILL DARTFORD KENT (0322) 92513/8
MAIL ORDER 8 HIGH STREET HORLEY SURREY 24 HOUR CREDIT CARD SALES HORLEY (02934) 6083
PAYMENT BY CHEQUE P.O. ACCESS/VISA 50p POSTAGE & PACKAGING

attention." And it seems that the smaller software houses are in a better position to move rapidly — even if it's just to convert old 64 and Vic titles.

Melbourne House were one of the first major companies to put out anything for the Commodore 16 with their Book of Games and subsequently *Games Packs I and II*. Since then, according to Paula Byrne, their publicity manager, "we've been inundated with requests for more games.

"There's been an overwhelming demand from people who've bought the machine and found out there

wasn't much to play on it." So all of a sudden smaller software houses are writing fast and furiously to fill the vacuum. Doubts or no doubts.

Short on adventure

There are bound to be some who consider that the Commodore 16 doesn't warrant the sheer effort of software development. Marketing considerations aside, some are put off by its limited memory. This applies particularly to adventures which require larger memories. Level 9 cannot

convert its existing games and consequently has no plans for any new C-16 adventures. The same goes for Legend who consider the constraints of memory off-putting. Most adventures that are or will be available are of the text-only type.

The other main bugbear is the 16's lack of sprites. However, Solar Software consider that as a means of getting better character definition. Colin Courtney's programmers at Tynesoft were more than surprised at its capabilities. "The graphics are as good as the 64's, there's no sprites, but that can be compensated

for." He's so impressed with it as a beginner's computer that he's dropped all his other stuff to concentrate on the 16.

Commodore backing

These opinions more or less echo Commodore's own about the machine. They know its limitations, but equally well they know it has a market. Rae Potter, software marketing manager at Commodore, is adamant. "There is a huge market for a starter machine and it will be supported, the ball has started rolling. It would be ludicrous for even the big software companies to miss out."

One indication to the market for C-16 software sales is that Craig Communications' *Flight 015* has sold over 10,000 copies since it was released just before Christmas. Whether the Commodore 16 will prove to be as successful as the Vic remains to be seen. It's doubtful that it will, it's more of a temporary measure. However, its price and the items included (1531 cassette unit, Introduction to Basic, Picture builder, XZAP, Punchy and Starter Chess) make it very attractive to the first-time buyer. In fact, since the 16K Spectrum was withdrawn, it is the cheapest machine on the market.

Software houses are beginning to realise that there is a boat and if they don't move fast enough they're going to miss it. Even those who doubt the C-16's viability are putting a conversion or two out to test the market. As for quality, it's only fair to say that at the moment it's not that high. Only a few new and original programs are available: like Anirog's 'Out on a Limb' which was written for the 64 but diverted to the 16, and Jeff Minter's *Psychedelia* (though even that's released simultaneously on the 64 and Spectrum).

Those companies which have chosen to ignore the C-16 may find that they'll have to change their minds. So, if you bought a 16 over Christmas, don't worry, help is at hand. Meanwhile, a list of what's currently available follows whilst Screen Scene this month tests a few of the new titles out.

COMPANY	TITLE	TYPE	PRICE	AVAILABLE
Commodore	Mayhem	Arcade	£5.99	.
	Harbour Attack	Arcade	£5.99	.
	Stellar War/Blitz	Arcade	£5.99	.
	Crazy Golf	Simulation	£5.99	.
	UXB	Arcade	£5.99	.
	Space Sweep	Arcade	£5.99	.
	Jack Attack	Adventure	£14.99	.
	Pirate Adventure	Adventure	£11.99	.
	Atomic Mission	Adventure	£11.99	.
	Strange Odyssey	Adventure	£11.99	.
	Fire Ant	Arcade	£5.99	.
	Purple Turtles	Arcade	£5.99	.
	Exorcist	Arcade	£5.99	.
	Locomotion	Arcade	£5.99	.
Anirog	Galaxy	Arcade	£6.95	.
	Space Commander	Arcade	£6.95	.
	Out on a Limb	Arcade	£6.95	.
Bubble Bus	Hustler	Simulation	£6.99	.
	Cave Fighter	Arcade	£6.99	.
Citisoft	Slippery Sid	Arcade	£6.95	.
Craig Communications	Flight 015	Simulation	£5.95	.
Creative Sparks	Tower of Evil	Arcade	£5.95	11th March
CRL	Berks	Arcade	N/A	.
Gremlin Graphics	Zargon Wars	Arcade	£6.95	.
Llamasoft	Psychedelia	Entertainment	£6.00	.
Mastertronic	Jackpot	Simulation	£1.99	.
Microdeal	Mansion Adventure	Adventure	£3.99	.
	Williamsburg Adventure	Adventure	£3.99	.
	Cuthbert in Space	Arcade	£6.95	.
	Cuthbert Enters the Tombs of Doom	Arcade	£6.95	.
	Games Pack I	Various	£5.95	.
Melbourne House	Games Pack II	Various	£5.95	.
	Roller Kong	Arcade	£5.95	.
	Classic Adventure	Adventure	£5.95	.
	The Wizard and the Princess	Adventure	£5.95	.
	Hunchback II	Arcade	£6.95	1st March
Ocean	Daley Thompson	Simulation	£6.95	1st March
	Kong Strikes Back	Arcade	£6.95	1st March
	Purple Turtles	Arcade	£5.99	.
Quicksilva	Tornado	Arcade	£5.99	.
	Skyhawk	Arcade	£5.99	.
Romik	Pottit	Simulation	£6.99	.
	Blaze	Arcade	£6.99	.
Solar Software	Galaxians	Arcade	£6.95	.
	Monkey Magic Quest	Arcade	£6.95	.
Supersoft	Kaktus	Arcade	£3.95	.
	The Chip Factory	Arcade	£3.95	.
Tynesoft	Shoot-it/Climb-it/ Munch-it/Hoppit (4-pack)	Arcade	£14.95	.
	Rig Attack	Arcade	£6.95	.
	Olympiad	Arcade	£6.95	.
	Lunar Docking	Arcade	£6.95	.
	Excalibur	Arcade	£6.95	.
	Zapem	Arcade	£6.95	.

* = available now



Top Floor
1 Sandy Road
Seaforth
Liverpool L21 3TN
Tel: 051-928 8443

PROGRAMMERS

WE ARE LOOKING FOR TOP QUALITY PROGRAMMES TO MARKET IN THE UK AND ABROAD. THE PROGRAMMES MUST BE OF TOP QUALITY AND IN MACHINE CODE WITH GOOD GRAPHICS AND SOUNDS AND ORIGINAL CONCEPT. WE ARE LOOKING FOR PROGRAMMERS TO CARRY OUT WORK ON NEW MACHINES SUCH AS THE C.B.M/16 AMSTRAD AND M.S.X. WE CAN SUPPLY THESE MACHINES TO CARRY OUT WORK FOR MIRAGE. WE ARE ALSO OFFERING £500 PRIZE FOR THE BEST PROGRAMME RECEIVED BY THE END OF FEBRUARY 1985 WHICH WE WILL DECIDE TO MARKET. WE OFFER AN OUT RIGHT PAYMENT OR 10% PLUS PAYMENT OR 20% ROYALTIES. FOR MORE INFORMATION CONTACT THE SOFTWARE MANAGER HE WILL BE GLAD TO LISTEN TO ANY QUESTIONS YOU MAY HAVE.

SOFTWARE HOUSES

WE ARE LOOKING FOR TOP SELLING PROGRAMMES TO DISTRIBUTE TO OUR WIDE RANGE OF OUTLETS THROUGHOUT THE UK AND GIVE YOU A VERY FAST SERVICE TO HELP WITH YOUR SALES AND TO MAKE THE MOST OF YOUR PRODUCTS. SEND A SAMPLE COPY OF YOUR PRODUCTS WITH RATES AND TERMS FOR A FAST ASSESSMENT. FOR MORE INFORMATION CONTACT THE SALES MANAGER HE WILL BE GLAD TO HELP AND ASSIST YOU.

DEALERS AND DISTRIBUTERS

DEALERS WE HAVE THE BEST SELLERS FROM THE BEST PRODUCERS; WE ALSO OFFER VERY GOOD RATES AND TERMS TO HELP YOU AND US TO ACHIEVE THE BEST SALES AND SERVICE. FOR MORE INFORMATION CONTACT THE SALES MANAGER.

DISTRIBUTERS HAVE YOU GOT THE MIRAGE RANGE ON YOUR SHELVES, IF NOT THEN CONTACT THE SALES OFFICE FOR SAMPLES AND RATES.

SALES MANAGER
T.C. SAPHIER

SOFTWARE MANAGER
C.A. SAPHIER

MICRO-WAVE RADIO

No matter where you live, or what language you speak communication is a very important part of your life. Amateur radio operators have a unique opportunity to communicate with fellow amateurs world-wide. Since the days of Marconi, radio enthusiasts in Great Britain and the United States have shared a special cameraderie. It's hard to believe that it has only been in the last score of years that a historical satellite contact was established between our two countries, a modern day re-enactment of Marconi's original transatlantic feat.

Now, another revolution brings us closer together. The day of the micro has finally arrived, much to the pleasure and enthusiasm of radio operators all over the world.

Plans for the series

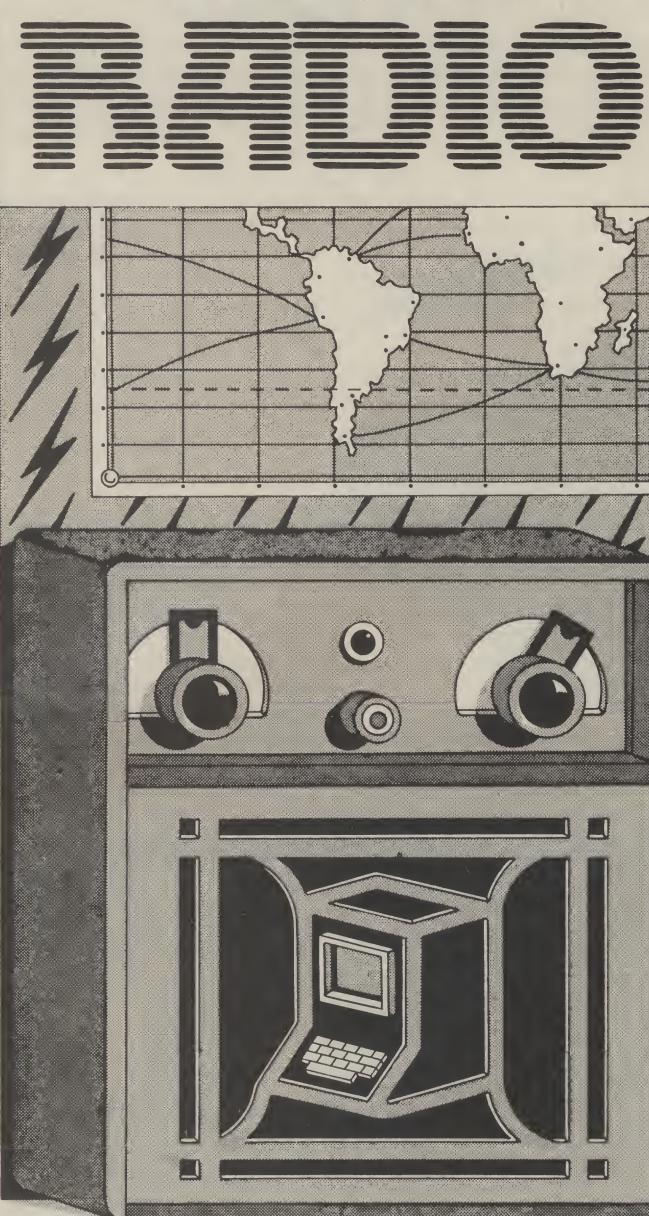
For the next four months, I'll escort you gently through the necessary programs to make good use of your Commodore computer in the ham shack and short wave listening post.

On tap is a morse code receiving program that will take you only minutes to type in and an accompanying hardware interface you can build yourself. The interface is a sort of radio modem that is necessary to match your computer to your radio equipment.

If that sounds like a formidable task, take heart, the circuitry is relatively simple. Though I wouldn't recommend the project to someone who has never breathed the aroma of hot solder, it should be manageable for DIY electronic types. You can always enlist the aid of a more seasoned operator.

To make a matching set, the following month we'll add a morse keyboard to the program that will take the drudgery out of sending. It can even be used for practicing morse code, so if you are just getting started, that may be the program for you!

Finally we will delve into the world of radio teletype transmissions. Using the same interface you built for morse reception, I will pass along an easy program for receiving



Part 1 – introducing ham radio with the Vic and 64

We all know that you can connect your Vic or 64 to the outside world through a network like Micronet and CompuNet. But how about amateur radio as an alternative? Radio hams have been connecting micros to their radios for some time to transmit and receive a variety of information. Jim Grubbs, radio ham and Commodore enthusiast, takes time out from his regular reports on Radio Sweden International, to write a four-part series. This month he introduces the subject, reveals plans for the series and gives a few contact addresses. **By Jim Grubbs**

teletype signals at all of the standard speeds.

Not everyone likes to build equipment from the ground up or even type programs. With that in mind, we hope to take a look at some commercially available products that work well with the Commodore computers.

The Commodore Vic-20 and Commodore 64 seem to have been designed with the experimenter in mind. No other machine in any price range makes the connections available for interfacing the computer to the ham shack like the Commodore machines. The problem seems to be in finding sources of information to explain how to make use of these connections. If I do my job correctly, this series will be one of those sources.

Ways to use your Vic and 64

What can you do with your Commodore micro in the ham shack, or the short wave listening post? There are several obvious answers and some more obscure ones as well.

Computers lend themselves to two tasks quite well. Number one is data crunching. Logging and other record keeping functions are just subroutine functions of database management that computers handle so well. The second is manipulation of coded data. After all, that is what your micro ultimately does with any program it runs, that is, manipulate coded data.

Morse Code, radio teletype, ASCII, and TOR or AMTOR (teletype over radio) are likely candidates for interpretation by your Vic or 64. In fact, next time, I'll put you on to a fairly simple Basic language program for receiving morse code and having it displayed on your monitor screen!

The possibilities do not end there however. A gentleman in Virginia has written a machine code program that allows your computer to be used to view slow scan television. Packet radio is becoming more popular with the availability of low cost com-

puters. Even a packet amateur radio satellite is in the works.

While I won't be covering these advanced subjects right away, they could be the subjects for future articles if you show an interest in them.

Looking at the equipment

In my ham shack, a Vic-20 lives full time. Right now I use only a datasette and a 1525 printer. I do have 16K of memory expansion with an eight slot mother board. With this equipment and several interfaces I use my Vic for all of the things already mentioned.

I use my Commodore 64 to write this column, along with a 1541 disk drive, another 1525 printer and a letter quality printer. I'm also somewhat fond of telecomputing, so several modems round out my "office" equipment. Yet another Vic does control operation around my house on a full time basis.

In the months ahead, the programs presented will be written so that even those among you with an unexpanded Vic will be able to make them work. Special attention will be given to the differences between the two machines. Occasionally a technique will only work on one machine or another, but I'll try and keep those to a minimum.

Please feel free to contact me with your questions. Perhaps the best way to do so would be to address your mail to **Commodore User**. Keep in mind the delay in answering mail from across the sea. If you do wish to contact me directly, you may do so at PO Box 3042, Springfield, Illinois 62707 USA. Please include an International Reply Coupon (buy them at post offices) or US postage if you wish a response. The postage bill is a bit steep even from my Stateside readers, so your understanding is appreciated.

Sources of Information

Rather than haphazardly trying to describe a useable program in the remainder of this month's space, let's take a look at some sources for inexpensive programs that you can use in the ham shack.

• The "Public Domain" people at 5025 South Range-line Road, West Milton, Ohio 45383 USA have been

MICRO-WAVE RADIO

supplying programs for Commodore computers for some years, first with the PET and now with the Vic and Commodore 64. Programs are sold as collections. Some of these disks or tapes have fifty or more programs on them! Each collection is priced at \$10 US. I'm sure there will be an additional charge for overseas postage, so check with them first.

• Many of Mike Apsey's "Journal/20" amateur radio programs are included in the collections, including Mike and Rick Myers very popular **J-20 Morse**. Other programs are included for logging, duplicate contact checking, beam headings and so on. Not every program is a gem, some of them don't even run correctly, but for the money they are hard to beat.

• The **American Radio Relay League** offers through its "Online" column in **QST**, printed listings of several programs for Commodore ma-

chines. The only cost is for postage. Write to: American Radio Relay League, Department PX, 225 Main Street, Newington, Connecticut 06111 USA.

• Ed Cox, AA4BB, is a busy man. He is a medical doctor by profession, and when he's not busy with that, he edits and publishes **VicComm**. This is a truly great addition to the Commodore community, and particularly to the amateur operators. It is Ed's program that I mentioned for SSTV. You may contact him directly at Box 5491, Duke Station, Durham, North Carolina 27706 USA, for more information on his publication and programs.

• If you are in to tracking amateur satellites, or nearly any satellite for that matter, **AMSAT**, the **Amateur Radio Satellite Corporation** has an absolutely terrific program called **AMS-2064** for \$15 US. I used it to track Owen Carriott aboard the **STS-9**

shuttle mission with great success. Contact **AMSAT** at PO Box 27, Washington, D.C. 20044 USA.

• The **Association of North American Radio Clubs** has an extensive collection of programs designed for the short wave listener. A special collection (one each) for the Vic-20 and Commodore 64 are available. For more details contact: **ANARC** c/o Bill Krause, 6700 153rd Lane NW, Anoka, Minnesota 55303, USA.

• According to George Wood at **Radio Sweden International**, the European DX council held a workshop on computers and shortwave listening at their 1984 conference in Stockholm. They recommended forming a committee similar to the **ANARC** group. Jonathan Marks of **Radio Nederland** has volunteered to head the activity along with Per Eriksson of the Swedish DX Federation and George Wood. More information should be available from Jonathan. You may reach him at **Radio Nederland Wereldomroep**, PO Box 222, 1200 JG Hilversum, The Netherlands.

• Jonathan hosts a weekly show entitled "**Media Network**" over **Radio Nederland**. Experiments have been done using a "universal" language called **BASICODE** to broadcast computer programs over shortwave.

• I hope you will join host George Wood for "**Sweden Calling DXers**," heard on **Radio Sweden International**. Yours truly will be providing news and information on using computers in the radio post. Contact George for further information at: **Radio Sweden International**, S-105 10, Stockholm, Sweden.

• **BASICODE** experiments have also been run on **BBC Radio Four's "Chip Shop"**. Check your local listings as they say!

That should keep you busy for the next month posting some letters off to foreign shores. I'd be very happy to learn of any **G** land suppliers of amateur software for the Vic and C-64. I'll share that information in future months.

Next month, we'll make your Commodore understand Morse so that even **Samuel F.B.** would be proud. Until then, cheers from the radio post!

USER PROFILE

Bryan Hartley is a pretty keen amateur radio enthusiast with almost twenty years of 'listening in' and transmitting behind him. He's got both a Class B and A Amateur Radio Licence and now owns both a Vic-20 and a Commodore 64. Bryan's no exception; in his area of Poulton-le-Fylde in Lancashire, he reckons there are many more 'hams' using Commodore computers.



But what does he do with all these computers and radios? Primarily, Bryan tracks the numerous amateur radio satellites that whizz around up there in space. These help hams increase their range when transmitting and receiving from countries as far away as Russia and the States. Bryan used to track the daily satellite orbits on paper but found a program for the Vic which makes the job that much easier. It even calculates the elevation and direction in which his transmission must be pointed.

With its larger memory the Commodore 64 lets Bryan do much more; like his 'sunspot' program which tells him what the highest and lowest useable frequencies are for any particular country. He's also using it to track the new Oscar 10 satellite.

Of course, Bryan's got a pretty expensive radio, a Yaesu FT102 transceiver and does a lot more than work with Morse code. But any beginner with a reasonably good radio with a short-waveband can receive Morse code with the interface and Basic program we'll be telling you about next month.

Currah Speech 64

Speech Synthesizer

The Currah Speech 64 synthesizer and powerful amplifier uses the popular SP/0256-AL2 speech chip and has an almost infinite vocabulary. It has a text-to-speech interpreter for ease of speech output creation. Everything you wish to be spoken is entered in normal English, without special control codes or characters, it is therefore extremely easy to use. The voicing of the words is completely user transparent and the computer can carry on its normal running of a program while the speech chip is talking.

Speech Synthesis

The Commodore 64 speech synthesis utilises parts of the spoken word known as allophones. These are actual sounds that go to make up speech. The SP/0256-AL2 allophone speech synthesis technique provides the ability to synthesize an almost unlimited vocabulary. Fifty-nine discrete speech sounds (allophones) and five pauses are stored in the speech chip's internal ROM.

Text to Speech

Although there are only 26 letters in the alphabet, letters have a totally different sound when used in different words. For example, the 'a' in Hay is much longer and softer than in Hat. When you speak you automatically make adjustments because you know how a word should sound. Not quite so easy with a computer.

The 8K byte Read Only Memory contains all the instructions necessary for the SPEECH 64 to perform all of its more advanced functions including *Key Voicing * Text to speech conversion * Operating system. Having all the software on ROM means that Speech 64 is ready to use as soon as the computer is switched on. Unlike RAM, ROM is non-volatile, it retains the information inside even when the power is turned off.

The 500 gate 'Semi-custom' chip was developed in close co-operation with General Instrument Microelectronics and looks after all the hardware functions ensuring that the SPEECH 64 and your computer communicate properly.

Output via the T.V.

Analogue components together perform the functions of turning the speech output from the SP/0256-AL2 into audio level signals that can be fed into the C64 for output to the TV. They filter out the undesirable low and high frequency signals in the speech output and also amplify the signal to a suitable level.



New Basic Commands

There are 5 new Basic Commands which control all the functions of the interface. Making the Synthesizer very easy to use. You can even choose from a high or low voice and individual allophones can be 'intoned' to add character. Or use the synthesizer to create voice like sound affects.

10 SAY "HELLO"

The above is an example of the Syntax for entering speech into the computer and shows how simple it is to use.

The instruction book gives comprehensive details and examples of how to use the interface both from machine code and basic.

How to Order

The Currah Speech 64 costs only £29.95. You can obtain your synthesizer through any good computer store or by completing the order form and returning it to:

dk'tronics Limited, Shire Hill, Saffron Walden, Essex. OR by telephone quoting your Barclaycard or Access number. Orders normally despatched within 24 hours.

Please rush me

....[QTY] Commodore Speech 64 at £29.95 + £1.25 p&p
I enclose cheque/PO/Cash for Total £.....
or debit my Access/Barclaycard No.

Signature.....

Name.....

Address.....

C U R R A H

dk'tronics

Saffron Walden, Essex CB11 3AQ
Tel: (0799) 26350 10 lines



ADVENTURE

REVIEW SECTION

Dracula bites back

It seems that ol' red eyes Count Dracula will never be allowed to enjoy his stake in peace, because now Melbourne House have injected some new blood into the fanged count with **Castle of Terror**, written by Grahame Willis and illustrated by Greg Holland, with music by Neil Brennan and additional programming by Peter Falconer.

They all get credits because they all deserve them; Willis for devising a fresh and enticing variation on an old theme, and Holland for graphics which, in terms of their detail, colour, clever animated elements and speed, equal and frequently surpass the standard set in the classic *Twin Kingdom Valley*. Neil Brennan's music, too, isn't just tacked on as an afterthought but adds measurably to the atmosphere all the way through — and makes me extremely envious of what some programmers manage to coax out of SID's 532 POKEs.

The game's ability to accept 'proper' sentences (such as "Get the axe and the knife and put them in the sack") as well as simpler verb/noun input means that the pleasure of playing it is available to youngsters and beginners as well as the experienced. And those graphics are almost worth putting on video. A transfusion will cost you just £9.95.

Adventuring with books

Usborne have followed by their useful and inexpensive beginner's guide to writing adventure programs (reviewed last month) with a couple more colourful and gloriously-illustrated titles at £1.99 which both present not only the full Basic listing for a text adventure but also pages of maps, locations and clues to which the player can refer while playing the game.

In *Island of Secrets*, you can pit your wits in real time



You might have thought the tidal wave of new adventures had receded after Christmas — not a bit of it. Software houses like CBS/Ariolasoft and Eclipse/Longman have decided that the Brits are still drooling for more American imports — it's bound to mean lots of great titles for '85. Read on, for news, reviews, a chart and a competition.

against the wicked castle-dweller Omegan, the speaking stone, the sage of the lilies, and many other beastly and benign characters as you explore the petrified village, the well of weakness, the clone factory and many other and frequently surpass the intriguing locations. *Mystery of Silver Mountain* is a little less nightmarish but features plenty of goblins, wizards and trolls to keep the younger adventurer happy.

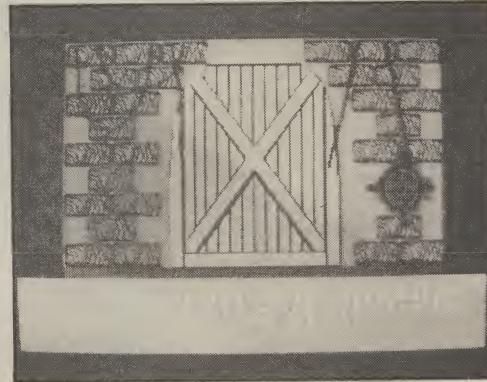
from Time-Life. Titles in the series, price £9.95 each, include *Witches & Wizards*, *Legends of Valour*, *Dragons* and *Fabled Kingdoms*. Expensive, maybe, but they're very smartly produced and splendidly illustrated. Write to Time-Life at 153 New Bond Street, London W1E 8WE for a copy of their brochure on this series, which is available by mail only.

Snowball, *The Hobbit*,

realise the potential which the splendid graphic and text adventures available today have in education.

Adventure the American way

No need to drool over inaccessible American adventures: the likes of Adventure International, Epyx and Avalon have now fixed themselves up with reputable UK



Castle of Terror "graphics are almost worth putting on video". This latest animated adventure from Melbourne House is our *Into the Valley* choice for the best 64 adventure of all time. Let us know what your favourite adventure is.

Apart from the entertainment you'll get from playing on your 64, 16 or Plus/4 (or Vic with 16K expansion), you'll probably learn some new programming techniques as you key the listings — though if you find that too laborious, Usborne offer each game on cassette at £5.99 (a little pricey, surely, but for the 64 and Vic only so far).

Adventure authors looking for inspiration should find plenty to interest them in *The Enchanted World* library

Valhalla and *The Quill* all feature in *Learning with Adventure Programs* by Rosetta McLeod (Melbourne House, 86pp, £6.95), which serves as a guide for teachers and parents of younger children, or slow learners, to the way in which adventure programs can be used to help improve communication skills. That's a worthy-enough role for adventures and the author, who is a principal teacher of English, gets my apple for helping others

distributors. *Ripper!* and *Telengard* from Avalon, marketed here by the Longman Group at £12.95 (disk only) and £7.95 (fastload cassette) respectively offer a tantalising glimpse of the quality of product from the US now at affordable prices.

Ripper! will definitely appeal to the purist, as it's a conventional text adventure centering on the reappearance in turn-of-the-century London of the man who brought spare-part surgery to

TURE NEWS • ADVENTURE NEWS • ADVENTURE

• After flirting with arcade adventure authorship for Commodore's *Spirit of The Stones* (which hasn't crept into anybody's chart at the time of writing), Ian Gray's *Empire of Karn* (Interceptor, £7 or £9 disk) has finally made it to the software racks. The second in a trilogy of graphic adventures, it won't disappoint admirers of *Heroes of Karn* or newcomers to the kingdom.

• Steve Jackson, the prolific author of Puffin's Fighting Fantasy DIY adventure books, is the imagination behind the new *Swordmaster* book/game adventure packages for the 64 from the omnipresent Adventure International.

• Games Workshop could have one of the text adventure hits of the year under their belt judging by favourable first impressions of *Tower of Despair* (£7.95). And having shrugged off the bad luck that's supposed to dog any association with Macbeth, Creative Sparks hope for a follow-up smash with a new graphic adventure, *Ice Palace*, featuring joystick-controlled commands.

• Dungeon and Dragon-type quest *Realm of Impossibility*, involving more than 120 locations, shares the spotlight with *Murder On The Zinderneuf*, an established Stateside hit, as the first two adventures from Ariolasoft, now marketing Broderbund and Electronic Arts titles in the UK. Prices are £9.95 and £11.95 (disk, £12.95 and £14.95) respectively for the debut duo. And the first Epyx titles to be imported by CBS include *Temple of Apshai* at £14.95, or £17.95 on disk.

• After Booty's much-deserved success, released on British Telecom's budget Firebird label (feted first on

these pages), I predict a similar success for *Gogo the Ghost*, a high-spirited arcade adventure with 150 screens and almost a steal at £2.50.

• All Level 9 text and graphic adventures for the 64 now come on disk at £11.95 — or £2.50 plus exchange with your existing cassette copy. New catalogue's just out — send a large SAE to Level 9 at 229 Hughenden Road, High Wycombe, Bucks HP13 5PG.

• Multi-User Dungeon, the massive text adventure originally run on Essex University's DEC10, has switched to Commodore's Compunet. Charges are £5 per month membership of the closed user group, permitting up to 36 simultaneous participants, plus £3 per hour play fees and your phone charges.

• New and pretty faithful implementation by Pete Gerrard of *Colossal Cave*, the massive text adventure that really started it all, is out from Duckworth at £7.95. Latest catalogue features too John Ryan's *Mountain Palace Adventure* and *Castle Dracula* by Ray Davies, also at £7.95 each.

• Deus Ex Machina, the adventure-cum-strategy game from Automata which combines computer play with a synchronised soundtrack featuring the voices of Frankie Howerd, Ian Dury and Jon Pertwee, is now available for the 64 on tape or disk at £15.

• US Gold, whose hits for the 64 have included *Beach-Head* and the acclaimed graphic adventure *Dallas Quest*, are launching a new range of titles on the All-American Adventure label. More next month.

RIPPER!

BY J. WINNIE & S. BARONETT JR.

Ripper. Win this game. See below.

CHARTS

So many readers who've entered our competitions have written about their favourite Adventures that we've decided to compile our own *Into the Valley Top Ten Adventures*. But the novelty of it is that the chart will reflect your own opinions. Simply write down your three favourites on the coupon when you send off your competition form. If you're not into competitions, just send us your top three on a postcard. Oh, and if you feel strongly you've been ripped off with an Adventure, let us know about that, too.

Until your replies start rolling in, you'll have to make do with my own Top Ten. How does it compare with yours?

- 1 Castle of Terror (Melbourne House)
- 2 Colossal Adventure (Level 9)
- 3 Zork III (Commodore/Infocom)
- 4 Eureka! (Domark)
- 5 Saga of Erik the Viking (Mosaic)
- 6 The Hobbit (Melbourne House)
- 7 Classic Adventure (Melbourne House)
- 8 Return to Eden (Level 9)
- 9 Spiderman (Adventure Int.)
- 10 Sherlock (Melbourne House)

the masses. But don't think for a moment that conventional means dull.

Authors John Winnie and Stanley Baronett give you a week to explore the mysteries of Hampstead Manor, to which several famous personages have been invited to pool their brains — but hopefully not their blood — in the task of detecting the true identity of Jack the Ripper. The twist is, at least one of the invitations may have been intercepted by the Ripper himself.

My only quarrel with *Ripper!* is the appearance of the alphanumerics, which have been redesigned to give the text screens a period flavour; its novelty wears off (and deciphering it grows more testing) as time goes by. That apart, *Ripper!* is an important addition to that still very exclusive library of imaginatively and professionally-produced text adventures; I

dare say it will be earning a place in our Top 10 very soon.

Telengard goes for gold

Telengard also gets a thumbs up for combining the elements of a role-playing and graphic adventure in one appealing game, much as Oracle's Cave did. The graphics aren't quite as sophisticated as the Dorcas hit, but the cast of characters, depth of attributes and play options make up for that.

Better still, you can achieve a game of Telengard in different ways; aim to achieve a certain level of advancement, develop your abilities for casting spells or charms, or just amass as much gold as you can in a given time. The fat little booklet that comes with the game packs in loads of different facts and hints about the monsters and other challenges you'll meet and the powers at your disposal.

This thoroughness, and the playing, and the virtually limitless variations on your program's decent logic, probably makes it the only computer adventure that means that Telengard is a Dungeons and Dragons challenge that can never go stale.

COMPETITION

Since we've mentioned the new *Ripper!* game from Avalon, the nice 'n' simple question for this month's quiz is: in which area of London did Jack the Ripper commit his wicked deeds? Now go ahead and write your answer on the coupon below, not forgetting to include your three favourite adventures.

Name _____

Address _____

My three favourite adventures are:

1 _____

2 _____

3 _____

Send your entry to: Ripper Competition, Commodore User, 30-32 Farringdon Lane, London EC1R 3AU.

INTERPOD

Now the VIC 20 and 64 can communicate with PET peripherals



VIC and 64 users

Would you like to be able to access **any** of these peripherals from your computer?

- 1.3 megabyte disks (Commodore 4040 drive)
- 1 megabyte disks (Commodore 8050 drive)
- 10 megabyte disks (Commodore 9090 hard disk)
- Printers including a wide range of inexpensive IEEE and RS232 matrix and quality printers
- IEEE instruments such as volt meters, plotters etc.

Now you are no longer limited by the VIC or the 64's serial bus. Simply by attaching INTERPOD you can vastly increase the power of your VIC 20 and when used with the new 64, INTERPOD turns the computer into a really powerful system.

With INTERPOD the VIC and 64 become capable of running really professional quality software such as Word-processing, Accounting, Instrument control and many more.

INTERPOD will work with any software. No extra commands are required and INTERPOD does not affect your computer in any way.

Using INTERPOD is as easy as this:

Simply plug INTERPOD into the serial port of your computer, power-up and you are ready to communicate with any number of parallel and serial IEEE devices and any RS232 printer.

£59.95

Simply incredible at £59.95
Prices include VAT, Postage and Packing. Delivery normally 14 days. Export orders at no extra cost.
Dealer enquiries welcome.

Send cheque/PO now to:-



Cheetah Marketing Ltd, Dept CU, 24 Ray Street,
London EC1R 3DJ. Tel: 01 833 4909.
Telex: 8954958.

Turtles on the move

A look at Commodore LOGO and the Valiant Turtle

by Chris Durham

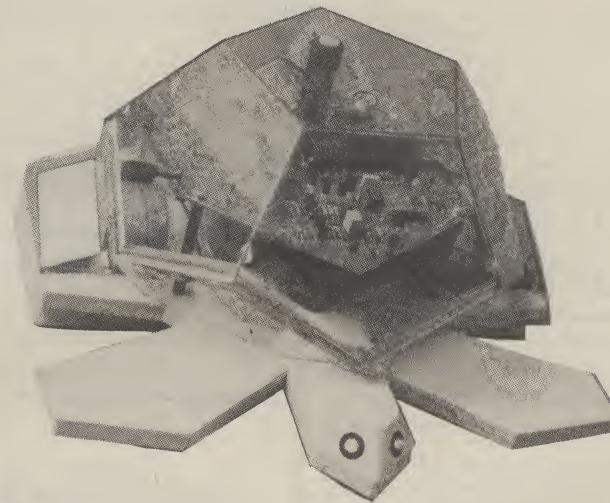
LOGO, that language of graphics and turtles, is often talked about but is rarely heard of outside schools, where its "turtle" facility is used as a fun and effective way of teaching young children geometry. Now, anyone with enough enthusiasm (and money) can buy both a mechanical Turtle and an implementation of LOGO to run it. Chris Durham introduces the language with a brief look at Commodore LOGO and puts the new infra-red controlled Valiant Turtle through its paces. For those of you who'd rather read about it, there's a book review, too.

Let's start by taking a brief look at the LOGO language. Commodore have a version of LOGO for the Commodore 64 on disk. It comes complete with a second disk containing utility programs and a comprehensive manual; all for £37.95. For anyone who wishes to delve into the language of graphics, turtles, procedures and list-processing it is a comprehensive package that will take you from the first fumbling steps right up to highly detailed text and graphical programs.

LOGO as a language

Some of you may well be asking: "Why another language? Haven't we got enough already with Basic, Forth, Pascal etc?". The simple answer is that no single language is ideal for every type of task; you only have to look as far as Commodore Basic to see that. LOGO for the 6502 range of processors was designed at the Massachusetts Institute of Technology (MIT) in 1981. Its main claim to fame was the small turtle (called a terrapin) which was used to draw items on the screen; this is often the only thing people know LOGO for.

The object was to help people relate the drawing with how it was made up. As such, it is very useful in schools where children learn all about triangles, squares and other shapes while driving a little "turtle" round a TV screen. To think that this is all LOGO is capable of doing, however, would be to deny the language its great flexibility, its structured format and its ability to cope with



text in a very efficient manner indeed — but this article is not intended to delve into LOGO's more sophisticated features.

Procedures in LOGO

Many people decry Basic because it is not a "structured" language; at least, it wasn't before the advent of BBC Basic. In simple terms this means that you cannot define a section of code once only, name it and then use it just by putting the name in the program where you want the code actioned. Most other languages have the ability to define "procedures" and then call them for use later in the program. Anyone familiar with either Pascal or Forth will already be familiar with this.

In LOGO, you have a number of commands, called "primitives". These include the commands for moving the turtle, reading from disk etc. Procedures are built up by writing a block of code to do a specific task, using the available primitives, and then

giving that block a name. This name is then available to be used as a valid language command in further blocks of code being called a "procedure".

Of course, if you had to build up the entire language from a few basic commands it would become very laborious, hence there are many machine specific primitives and procedures already available in Commodore LOGO. These allow full use of the sound, text and graphics facilities of the 64. Since procedures are a fundamental part of the language, examples will appear throughout the article, but I haven't got the space here to cover some of the more advanced uses for procedures.

The screen turtle

To be strictly accurate, the turtle is a small triangle, but who's going to quibble? The screen turtle acts in much the same way as the Valiant Turtle, of which more later. You give it commands to move

either forward or back and to turn either right or left; you can also raise and lower the "pen" which allows it to trace its path. The commands are extremely straightforward, which is why it is so popular with children; they can have the turtle scurrying round the screen in no time at all.

For example, the sequence: **FD 20 RT 90 FD 20 RT 90 FD 20 RT 90 FD 20 RT 90** would draw a square. This can be further simplified to: **REPEAT 4 (FD 20 RT 90)**.

Circles, triangles and almost any shape can be built up from these basic directions. If required, whole sequences can be incorporated into a single procedure so that instead of even the simplified version above we could define a procedure for drawing a square as follows:

TO SQUARE

REPEAT 4 (FD 20 RT 90)

Now, just typing **SQUARE** would draw our square for us.

If a mistake is made in a particular sequence you can go back, erasing the wrong line, and try again. You can even make the turtle "disappear" from the screen with the command **HIDETURTLE**; it will still draw though, even when invisible. In case some of you think that commands as long as that are a chore to type, most have 2-letter abbreviations which can be used instead (eg **FD** is short for **FORWARD**); the two forms are completely interchangeable.

Colour Changing & Screen Modes

Unlike Basic, which can change the character colour very easily, but which is less than fantastic when it comes



PROFESSIONAL PRESENTATION CHARTMAKER

This sophisticated package gives you high-resolution charts in any of 8 different formats, using data entered from the keyboard or produced by some of the popular spreadsheet programs (e.g. Busicalc 1, Multiplan, Calc-Result). Charts and data can be saved to disk. The program is menu driven and no programming is required. You can easily change the format and build another chart and hardcopy can be produced in single or double size on most of the popular dot matrix printers. Available only on disk for the CBM-64

Price £24.95

BOOKS

Because these books are now published in the U.K. they have been further reduced from the original USA imported price of £14.95. However, prices will go up by 15% if VAT is introduced on books in the forthcoming budget — buy now and beat any increase. Ask for our full catalogue of books for the 64.

Anatomy of the Commodore-64	£8.95
Anatomy of the 1541 Disk Drive	£8.95
Tricks and Tips on the 64	£8.95
Machine Language Book of the CBM-64	£8.95

Prices are post-free in the U.K. Overseas add 50p per book surface mail or 3 pounds airmail. No surcharge on software. Pay by cheque/P.O., Access card or Transcash (ac no 687944007). Send s.a.e. for catalogue, stating which computer you own. Dealer enquiries welcome.

ADAMSOFT

(Dept. CU), 18 Norwich Avenue, Rochdale,
Lancs OL11 5JZ.

Tel: 0706-524304 (preferably after 6 p.m.)

3 BARGAIN OFFERS FROM OUR DISK-BASED SOFTWARE LIST For Commodore 64 and Plus 4

 * £40 SOFTWARE VOUCHER *
 * Valid March & April 1985 *
 * Cheque with order only *
 * E-A Software *

PAYROLL This must be the most comprehensive payroll for the Commodore 64 and Plus 4. Hourly, weekly and monthly basic, 7 overtime/piecework rates, 4 pre-tax adjustments incl. pension & SSP, 6 after tax, NI, all tax codes and bands. Deduction card printout. Printed payslips or plain paper. This payroll can be adjusted by the user when tax rates change.

Full price £114.42. With the voucher only £74.42

BARGAIN FIVE-PACK Simple purchase and sales system with invoices laid out to your own design, address label printing, stock control and nominal ledger for small businesses.

Full price £92.00. With the voucher only £52.00

SALES LEDGER AND INVOICING 200 customer accounts, invoices laid out to your own design, statements, daybook, aged debtors, address labels etc.

Full price £138.00. With the voucher only £98.00

DEMONSTRATION DISKS £5.00

Prices include VAT & postage.

Full refund on any item incl. demo disks returned within 21 days. Write or phone for details & complete list.

Electronic Aids (Tewkesbury) Ltd.,
62 High Street, EVESHAM, Worcs. QR11 4HG.
Tel: 0386 49339

TOP TEN

IN

EDUCATIONAL SOFTWARE

FOR THE

COMMODORE 64 or VIC 20

ONLY £4.95 EACH

- (1) PHYSICS O LEV/CSE
- (2) BIOLOGY O LEV/CSE
- (3) MATHS CSE
- (4) COMPUTER STUDIES O LEV/CSE
- (5) MATHS 12/14 YRS
- (6) SCIENCE 12/14 YRS
- (7) MATHS 8/11 YRS
- (8) ARITHMETIC 7/10 YRS
- (9) REASONING 11+
- (10) KNOWLEDGE 9/99 YRS

Immediate delivery by First Class Post

MICRO-DE-BUG CONSULTANCY
DEPT. CU. 60 SIR JOHNS ROAD
SELLY PARK, BIRMINGHAM B29 7ER

TEL. 021-472 7610

(Please state computer)

Written and produced by Qualified Educationalists.

Superbase 64

TRANSFORMS THE COMMODORE 64 INTO A FULL FEATURED PROFESSIONAL DATABASE SYSTEM, WITH UP TO 1000 CHARACTERS PER RECORD, UP TO 4 SCREENS... AND UP TO 128 ITEMS PER RECORD, DEFINABLE AS KEY, TEXT, NUMERIC, CONSTANT, RESULT OR DATE, IN FILES OF UP TO 16M CHARACTERS! SUPERBASE 64 EVEN HAS A SPREADSHEET AND CALCULATOR CAPABILITY, CALENDAR FUNCTIONS, EASY INPUT FROM WORDPROCESSOR OR DATA FILES, BOTH MENU-DRIVEN AND PROGRAM OPTIONS, SORTING/SEARCHING, FULLY DEFINABLE OUTPUTS... SUPERBASE 64 IS ESSENTIAL IF YOU WANT THE MOST FROM YOUR 64! SUPPLIED ON 1541 DISK WITH EXCELLENT TUTORIAL/REFERENCE MANUAL PLUS AUDIO LEARNING TAPE...

OUR PRICE £99.95 £88.00

Jetpack YOUR PROGRAMS WILL REALLY TAKE OFF WITH JETPACK 64! 100% COMPATIBLE WITH CBM BASIC, JETPACK COMPILES BASIC PROGRAMS INTO MACHINE CODE, RUNNING UP TO 25 TIMES FASTER... AND USING UP TO HALF AS MUCH MEMORY, TO GIVE FASTER LOADING, OR BIGGER PROGRAMS... AND IT EVEN ACCEPTS BASIC EXTENSIONS AND MACHINE CODE ROUTINES AS WELL!

OUR PRICE (DISK) £39.95 £35.95

Master 64 HAS EVERYTHING YOU NEED FOR PROGRAMMING TO TOP PROFESSIONAL STANDARDS! BASIC IV, MACHINE CODE MONITOR, AND 85 POWERFUL NEW COMMANDS... INCLUDING TOOLKIT, BUSINESS BASIC, KEYED ACCESS FILES, DISK DATA COMPRESSION, FORMATTABLE SCREEN ZONES, MULTIPLE SCREENS, DATE CONTROL, REPORT GENERATOR, 22-PLACE ARITHMETIC, SCREEN PLOT, SCREEN DUMP, AND MORE... ALL FOR ONLY £64.95!

VIZAWRITE 64

VIZAWRITE 64 IS A HIGH-PERFORMANCE, LOW-COST WORD PROCESSOR WITH ON-SCREEN FORMATTING, THAT TAKES FULL ADVANTAGE OF THE 64'S COLOUR, GRAPHICS AND MEMORY FEATURES... AND SUPPORTS VIRTUALLY ANY PRINTER! WITH A COMPREHENSIVE AND EASY-TO-FOLLOW USER REFERENCE MANUAL, VIZAWRITE IS THE ULTIMATE PERSONAL COMPUTER WORD PROCESSOR! AVAILABLE ON CARTRIDGE (£99.95 £78), DISK (£79.95 £68) OR WITH VIZASPELL (£99.95 £85)

*** WANT IT TOMORROW? *** CALL US TODAY! *** ON 01-546-7256

VIZASTAR	(DISK)	£99.95	£89.00	MULTIPLAN (US)	(DISK)	£29.95	£67.95
VIZASPELL	(DISK)	£59.95	£49.95	PRACTICALC	(DISK)	£44.50	£39.95
EASYSRIPT	(DISK)	£26.00	£65.00	PRACTICALC	(TAPE)	£29.95	£34.95
EASYSPELL	(DISK)	£50.00	£41.95	HOMEBASE 1-4	(SUPERBASE)	£17.95	
SIMON'S BASIC	(CART)	£50.00	£41.95	STEPPING STONES	(SUPERBASE)	£9.95	
FIGARO 64	(DISK)	£86.25	£75.00	PRINTLINK 64	(INTERFACE)	£29.95	

PRICES INCLUDE 15% VAT AND ARE CORRECT ON GOING TO PRESS. ORDER BY POST OR PHONE, USING CHEQUE, ACCESS/BARCLAY CARD OR OFFICIAL ORDER. DESPATCH IS BY SAME-DAY 1ST CLASS POST, PREPAID ORDERS FREE. PRODUCT DATA AVAILABLE ON REQUEST. REF A31



Calco Software

LAKESIDE HOUSE, KINGSTON HILL, SURREY, KT2 7QT. TEL 01-546-7256

to graphics colours, LOGO can do it all with simple commands. **PC X**, where **X** is a number between 0 and 15, changes the pen colour while **BG X** changes the background (screen) colour. Because there are two screens being used simultaneously, one for text commands and the other for the graphics drawings, it is possible to alter the text screen colours independently from the graphics screen.

There are three main screen modes: Textscreen, where only the commands are visible; Fullscreen, which is the full graphics screen; and Splitscreen, where the bottom third of the screen shows the commands while the top part shows the graphics. You can switch from one to another easily using the function keys F1, F3 and F5 or under program control. If you want text on the graphics screen, then you use the turtle's pen using the command **STAMPCHAR**. There is a procedure on the Utilities disk which allows whole strings to be written, but you can write your own just as easily if you want the practice!

Disk Commands

Being a disk-based language LOGO has many disk facilities including all the common ones of saving and loading files and reading the directory. As well as saving

files, you can also save and load individual procedures. This means that you can use the same procedures in a number of different programs without having to rewrite them. Additionally, you can save and load the graphics pictures that you have created, and by using another of the utilities provided, **PRINTPICT**, you can dump them out onto a Commodore printer although you have to exit from LOGO to be able to use it.

Now that we've taken a brief look at LOGO, it's time to turn our attention to a device that can turn LOGO commands into physical movement — the Turtle.

THE VALIANT TURTLE

In essence this is the screen turtle come to life. To add to the realism it even looks like a turtle, with its "shell", four legs and two eyes. It can do everything the screen turtle can (except disappear) including a pen which can be raised and lowered for drawing. The whole package costs £228 (£171 for schools) and consists of the turtle, communications device, power supply unit, floppy disk, and the manuals (it also includes a screwdriver for adjusting the wheels and a felt tip pen for the pen-holder).

Animal magic

The Turtle is very well con-

structed, consisting of a plastic base unit with a green transparent shell covering the works. The turtle measures approximately 26cm by 26cm overall and stands about 14cm high. There are two stepper motors which drive the two wheels situated either side at the rear, the front "wheel" being a large steel ball which allows the front to turn in any direction, rather like a caster. There is another small motor inside which drives a cam to raise or lower the pen. This is a good method because the pen is not held down, but rests on the paper under its own weight; thus any undulations under the pen do not lift the turtle off the ground.

The turtle has two red LED "eyes"; these are designed to go out just before the batteries expire, giving some advance warning. Recharging is carried out by plugging in the mains-powered unit, which can happily be left on overnight. If you are in a hurry, you can recharge the batteries to 75% in only four hours.

The speed is not fantastic; it took about four minutes to draw a 12cm circle, although this was a severe test as it had to change direction every millimetre. A square of 12cms should take about 45 seconds. Because it is much bigger, it can be watched by a much larger number of people than is the case with the screen tur-

tle. This makes it ideal for use in schools where the number of computers may be limited, but a large number of children want to see what it's doing.

Mobility and accuracy

The accuracy of the turtle is remarkably good. Because the motors are steppers it allows the turtle to be moved in discrete, finite steps, ensuring that the turtle moves in straight lines and turns exact angles. I gave the review turtle a complicated "obstacle" course covering nearly three metres, returning eventually to its start point. Even with abbreviated commands, the sequence took four lines of the screen, yet when the sequence was completed the pen was only 3mm from where it had started. On smaller drawings the offset was too small to measure.

On the mobility side there are drawbacks: the wheels do not protrude from the case very far, hence any slight bump and the turtle scrapes its bottom. This immediately causes it to go off course and loses all accuracy. In fact, the turtle is designed to be used on large sheets of paper (in order to do the drawing) and even then, any joins in the paper are immediately suspect; they must be extremely smooth otherwise either the pen or the wheels will foul it and bang goes the



drawing. The manuals do tell you not to use it on any deep pile carpet for fear of picking up fluff in the motors. You need have no worries about this, the beast will not run at all on any kind of carpet, let alone a deep pile one.

The fact is that the turtle will only run on a dead flat, smooth surface. Since most homes are thoroughly carpeted, the only other solution seems to be the dining table, but that means lugging around the computer, disk drive, TV etc and setting it all up before you can use it; not very convenient if you normally use the computer in an upstairs bedroom. Besides, if the turtle needs the table, where do you put the computer?

Communications

The Valiant Turtle is one of the first "small" robotic toys to be operated by a "cordless" link; in this case infra-red. Thus there is no cable to get snarled up and if you want the turtle to turn round four times or go under a table so be it, there is nothing to stop you. The communicator is a slim grey box with a red transparent plate at one end. This box plugs into the User-port of the 64 via a ribbon cable and is powered by the same unit that charges the batteries on the turtle. The communicator has a surprisingly wide range and only needs to be pointed in the general direction of the turtle. The unit still managed to control the turtle when it was just inside the door of another room 10ft down a corridor (the unit being on a table in the middle of the first room). It finally lost contact 2ft inside the second room. A good point was that the turtle immediately stopped; it did not go trundling mindlessly on once it had lost the control signals. Even walking in front of the unit appeared to have no effect. The infra-red link is very definitely a far superior way of controlling such a device than any form of cable connection, even though this is presumably reflected in the price.

The software and manuals

The software comes on disk and you have to load and run Commodore LOGO first. This is because the commands for the turtle use the LOGO

language as a shell and give you the procedures necessary to drive the communications module. Because some of the procedures are identical to some of the LOGO "primitives", the Valiant software has to change the relevant primitives so that there is no clash.

Full instructions on how to load and run the Valiant software are included on a separate, photocopied set of A4 pages, together with screen prompts as each stage is run. There is also a nine-page "User Guide", a comprehensive fault-finding guide at the back and instructions on how to adjust the beast if it draws less than perfect corners, for example.

Finally, there is a magazine, also with a glossy cover, called *Penup*. This gives various ideas for using the turtle, including games kids can play with it and includes examples of commands etc. Since all the commands are limited to the turtle moving aspects of LOGO, it is not necessary to have more than a rudimentary knowledge of Commodore LOGO in order to operate the turtle. As such the documentation is adequate; further progress being dependent on the children themselves.

Conclusions

The Valiant Turtle is a well designed, fun device which will keep children (and some adults) amused for hours. It can also, with appropriate tuition, help children learn a lot about geometry and drawing, although to be fair, a screen turtle could do this just as well. Whether there will be a large demand on the home market is questionable; not because there is anything wrong with the turtle, but because the room to use it will be limited and the cost will put it to the bottom of most parents' shopping list. This is a pity because I think the more children can "drive" computers to do things other than play games the better.

However, it is in the field of the classroom that I can see a major use for such a device. Provided teachers themselves are aware of what can be achieved using LOGO and the turtle, there has to be a future for it in schools. I hope so; it would be a sad loss if this little creature were to become extinct.

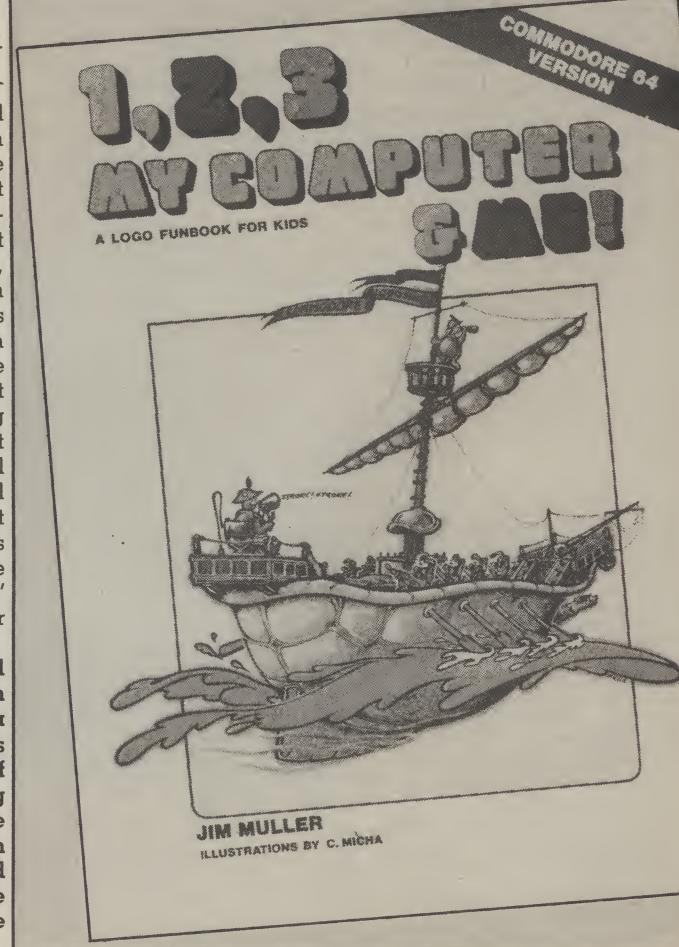
LOGO BOOK

Described as "a LOGO funbook for kids", this is a book to teach LOGO to children. Although it's American, there are very few of the jarring American phrases which often ruin otherwise good books of this sort, and as a result it is very readable. In fact, readable does not do this book justice; "do-able" would be much nearer the mark, since this book sets out to teach LOGO in a very interactive manner — and succeeds admirably. Unlike many books which say "to draw a square you do the following . . .", this book makes the kids think about it first. It positively encourages them to write in it, making notes of what they did, what the results were and then what they had to do to get it right.

It is a very compulsive book too — I had to restrain myself from trying out all the ideas (just for fun). If it has any failings it is that it doesn't go beyond the turtle drawing stage (albeit very detailed drawings) thus perpetrating the myth that LOGO is only useful for driving a turtle round a screen. It also has some minor errors, but these do not really detract from the content. Parents who want to understand what their offspring do all evening could do a lot worse than borrow this book after said offspring have gone to bed. The real crunch comes in the price, which I find difficult to justify. It's a good book, excellent even, but £14 worth of excellence?

Kids will love this book, but I fear that a great many parents (and children) will be put off by the price.

- 1,2,3 My Computer & Me!
- by Jim Muller
- Prentice-Hall International
- £14.00
- Expensive excellence



COMMODORE User

Deals For Readers
01-241 2448

Save over £50.00 in this month's catalogue with a wider range of deals on the best Vic and 64 products.

Below are just a few of the goodies on offer but to see our whole range look at the order form overleaf ... or why not write to us for a free catalogue.

On most of those we have fixed up discounts for readers (and while we aren't allowed to sell books at cut price, we can include P&P in our price).

If you want to take up any of the offers, just use the Order Form on the back page.

Doodle A drawing package with stunning results. Full drawing and painting facilities with zoom facilities for intricate drawing and editing. More accurate than light pens - as spectacular as Koala at a fraction of the cost! Output for printers including Commodore, Gemini, Okidata, Prowriter and Epson. For the 64.

OUR PRICE £13.99

GOLDEN
GREATS



OUR PRICE:

£6.99 per pack of three.

Vic Games from Audiogenic

PACK ONE: Amok • Alien Blitz • Bonzo

PACK TWO: Country Garden • Kaktus •
Mangrove

PACK THREE: Shifty • Pit • Golf
All-time favourites - action and
colour, great for the kids.

SPECIAL - ORDER ALL THREE
PACKS FOR £17.99

PLUS ALL THE USUAL BARGAINS

Dustcovers for Keyboard, Cassette & Disk Drive (for Vic-20 & CBM 64) - as well as past readers contributions on Victapes, video splitters, heaps of stuff from Stack, the best of the books, etc etc etc...

And by popular demand the 16K switchable Ram Pack at just
£34.95
Normal price £39.95

Just fill in the order form

Instant database for your 64

INFOTAPE

Why buy lots of different data storage systems when just one will do? INFOTAPE 64 is a powerful yet easy to use database system for tape users, and stores up to 3,000 data items with you defining the number of fields per record. Totally flexible; and interpretive in nature, with the user having the command of what data is stored and how. And file characteristics may be changed after the file has been created. Powerful 19-function calculator is built-in (giving spreadsheet capability); batch processor can update or delete all or selected records. A full report generator is included to provide anything from a gummed label for a mail shot to tabular reports...



Normal price: £16.95
OUR PRICE: £9.95

Spectrum Emulator

Whitby Computers' amazing tape makes the downgrade? True, but now you can enter Spectrum basic programs and magazine listings. Includes manual on how to program in Spectrum basic.

Available on tape at: £14.95

Now you're talking: Currah

Speech 64 is an allophone speech synthesiser which can say any word you require. It is fully compatible with the 64 and features two voices and on board text to speech firmware. Comes with complete manual for just £24.95 Normal price £29.95.

SIMPLY WRITE Word Processor

Simple, low-cost word processing for Vic or 64

You won't find a better word processor at the price - has all the functions you'd ask for from a £200 package, and it's friendly and easy to use too.

Disk or tape at only £34.95



64 Classics - 3 Great Games
for only £6.99

We've picked out four of Bubble Bus' classic games:
(a) Exterminator (b) Widows Revenge (c) Flying Feathers (d) Kick Off.

You can have your choice of any three for the price of one. Please remember to mark clearly your three choices on the order form.

Deals • for Readers

Make your disks go like lightning!

1541 EXPRESS

Ingenious plug-in cartridge accelerates disk transfers – see the October review for full details. By RAM Electronics, who really do these things well.

Normal price: £49.95
OUR PRICE: £45.95

VICSPRINT for Vic & 64
Trippler Interface

Serial IEEE to Centronics converter which doesn't use any program memory space. Plugs into the user port on Vic or 64 to interface with most printers (either daisywheel or dot matrix), and will work with most commercial packages. A RAM Electronics product RRP £49.95

Normal price: £49.95
OUR PRICE: £45.95

• Order Form •

Prices here include VAT and P&P within the UK and Ireland. For delivery elsewhere, please add overseas postage on each item as follows:

Item	Europe	Elsewhere
Books, binders, cartridges, assembler	£2.00	£4.00
Tapes, video splitters, tee-shirts, covers	£0.50	£1.50
Everything else	£1.00	£2.00

All offers subject to availability; please allow 28 days for delivery.
If there is anything else you would like to see in Deals for Readers, list below:

FOR THE 64

THE COMPLETE 64	no. <input type="checkbox"/> at £ 7.95 =
SUBROUTINE COOKBOOK	no. <input type="checkbox"/> at £ 7.95 =
SPECTRUM EMULATOR	no. <input type="checkbox"/> at £ 14.95 =
PIXEL PADS FOR THE 64	no. <input type="checkbox"/> at £ 4.95 =
RAM 1541 EXPRESS	no. <input type="checkbox"/> at £ 45.95 =
RAM VICSPRINT INTERFACE FOR 64	no. <input type="checkbox"/> at £ 45.95 =
64 CLASSICS PACKS REQUIRED A. B. C. D.	no. <input type="checkbox"/> at £ 6.99 =
SIMPLY WRITE 64 TAPE WORD PROCESSOR	no. <input type="checkbox"/> at £ 34.95 =
SIMPLY WRITE 64 DISK WORD PROCESSOR	no. <input type="checkbox"/> at £ 34.95 =
OSIRISAN 64 TAPE ASSEMBLER	no. <input type="checkbox"/> at £ 17.95 =
OSIRISAN 64 DISK ASSEMBLER	no. <input type="checkbox"/> at £ 22.95 =
COMMODORE USER TOOLKIT CARTRIDGE	no. <input type="checkbox"/> at £ 27.50 =
DAVID'S BASIC CARTRIDGE	no. <input type="checkbox"/> at £ 27.50 =
SPECIAL OFFER: BOTH TOOLKIT & DAVIDS	no. <input type="checkbox"/> at £ 50.00 =
INFOTAPE DATABASE (TAPE)	no. <input type="checkbox"/> at £ 9.95 =
DOODLE GRAPHICS PACKAGE (DISK)	no. <input type="checkbox"/> at £ 13.99 =
CURRAH SPEECH SYNTHESISER	no. <input type="checkbox"/> at £ 24.95 =
HELP TOOLKIT CARTRIDGE	no. <input type="checkbox"/> at £ 22.50 =
CENTRONICS INTERFACE CARTRIDGE	no. <input type="checkbox"/> at £ 22.00 =
RS232 INTERFACE CARTRIDGE	no. <input type="checkbox"/> at £ 29.95 =
64 COMPILER (DISK BASED)	no. <input type="checkbox"/> at £ 15.00 =
64 COMPILER (TAPE BASED)	no. <input type="checkbox"/> at £ 13.45 =
64 FOUR SLOT MOTHERBOARD	no. <input type="checkbox"/> at £ 29.99 =
MUSICALC 1 DISK (SYNTHESISER & SEQUENCER)	no. <input type="checkbox"/> at £ 49.99 =
MUSICALC 2 DISK (SCOREWRITER: CBM1525, EPSON)	no. <input type="checkbox"/> at £ 34.99 =
MUSICALC 3 DISK (KEYBOARD MAKER)	no. <input type="checkbox"/> at £ 34.99 =
SPECIAL OFFER: MUSICALC 1, 2, 3	no. <input type="checkbox"/> at £ 110.00 =
MUSICALC DEMO DISK	no. <input type="checkbox"/> at £ 6.00 =

FOR ANY USER

THE GOOD COMPUTING GUIDE	no. <input type="checkbox"/> at £ 2.95 =
ZAP-PROOF JOYSTICK	no. <input type="checkbox"/> at £ 7.95 =
VIDEO SPLITTERS	no. <input type="checkbox"/> at £ 1.75 =
MUSICALC DEMO TAPE (AUDIO)	no. <input type="checkbox"/> at £ 3.00 =
COMMODORE USER SWEATSHIRTS	no. <input type="checkbox"/> at £ 7.75 =
COMMODORE USER TEE-SHIRTS	no. <input type="checkbox"/> at £ 3.75 =
COMPUTER DUST COVERS	no. <input type="checkbox"/> at £ 2.50 =
CASSETTE DUST COVERS	no. <input type="checkbox"/> at £ 2.00 =
DISK DRIVE DUST COVERS	no. <input type="checkbox"/> at £ 3.00 =
FOR THE VIC	
VICTAPE 1 (GAMES FOR ANY VIC)	no. <input type="checkbox"/> at £ 1.99 =
VICTAPE 2 (FOR EXPANDED VICS)	no. <input type="checkbox"/> at £ 1.99 =
SPECIAL OFFER: BOTH VICTAPES	no. <input type="checkbox"/> at £ 3.00 =
GETTING THE MOST FROM YOUR VIC	no. <input type="checkbox"/> at £ 7.95 =
GRAPHICS AID PACK FOR VIC	no. <input type="checkbox"/> at £ 4.20 =
16K SWITCHABLE RAM PACK	no. <input type="checkbox"/> at £ 34.95 =
RAM VICSPRINT INTERFACE FOR VIC	no. <input type="checkbox"/> at £ 45.95 =
SIMPLY WRITE VIC TAPE WORD PROCESSOR	no. <input type="checkbox"/> at £ 34.95 =
SIMPLY WRITE VIC DISK WORD PROCESSOR	no. <input type="checkbox"/> at £ 34.95 =
OSIRISAN VIC TAPE ASSEMBLER	no. <input type="checkbox"/> at £ 17.95 =
OSIRISAN VIC DISK ASSEMBLER	no. <input type="checkbox"/> at £ 22.95 =
GOLDEN GREATS PACK NO 1 (FOR 8K+ OR MORE)	no. <input type="checkbox"/> at £ 6.95 =
GOLDEN GREATS PACK NO 2 (FOR 8K+ OR MORE)	no. <input type="checkbox"/> at £ 6.95 =
GOLDEN GREATS PACK NO 3 (FOR 8K+ OR MORE)	no. <input type="checkbox"/> at £ 6.95 =
SPECIAL OFFER: ALL THREE PACKS	no. <input type="checkbox"/> at £ 19.95 =
STACK'S VICKIT 2 EPROM	no. <input type="checkbox"/> at £ 4.90 =
STACK'S VICKIT 2 CARTRIDGE	no. <input type="checkbox"/> at £ 11.25 =
STACK'S VICKIT 3 EPROM	no. <input type="checkbox"/> at £ 4.90 =
STACK'S VICKIT 3 CARTRIDGE	no. <input type="checkbox"/> at £ 11.25 =
STACK'S VICKIT 4 EPROM	no. <input type="checkbox"/> at £ 4.90 =
STACK'S VICKIT 4 CARTRIDGE	no. <input type="checkbox"/> at £ 11.25 =
RAM 'N' ROM CARTRIDGE	no. <input type="checkbox"/> at £ 6.00 =
IEEE INTERFACE CARTRIDGE	no. <input type="checkbox"/> at £ 26.40 =
VIC FOUR-SLOT MOTHERBOARD	no. <input type="checkbox"/> at £ 13.80 =
8K STOREBOARD CARTRIDGE	no. <input type="checkbox"/> at £ 20.50 =
TOTAL ORDER	
PLUS OVERSEAS POSTAGE IF ANY	

Please state size (S, M, L, XL) when ordering shirts

PLUS OVERSEAS POSTAGE IF ANY

Postal orders, cheques or money orders should be made payable to DEALS FOR READERS. Or use Access (for Orders over £5 only):

NAME

◆ THIS IS YOUR DELIVERY LABEL – PLEASE PRINT CAREFULLY

ADDRESS

ACCESS CARD No

DATE

SIGNATURE

COMPETITION

Our Superheroes edition wouldn't be complete without an opportunity to get your hands on the Indy and Conan games absolutely free.

But we have many more prizes to offer. Our two tough guys used a bit of muscle with US Gold to get them to offer five complete sets of the entire US Gold range. You heard right folks, that's twenty-seven games apiece — with a total value of over £250 each. Remember there are five super first prizes.

Twenty runners-up will receive US Gold sweatshirts and badges. Get those entry forms rolling in.



GO FOR GOLD

Games left to right: Congo Bongo, Battle for Normandy, Slinky, Forbidden Forest, Combat Leader, Blue Max, Bruce Lee, Mystic Mansion, Conan, DatarPro, Strip Poker, Spitfire Ace, TextPro, The Dallas Quest, Raid Over Moscow, Zaxxon, Solo Flight, Beach-Head, Tapper, Pooyan, F15 Strike Eagle, Stellar 7, Spy Hunter, Caverns of Khafka, Sentinel, Indiana Jones, Drelbs, (not shown Buck Rogers, Up and Down).

TASKSET COMPETITION RESULTS

At last, the results of our great Taskset Competition in last December's issue. Staff at Taskset assessed the huge amount of entries and eventually came up with the outright winner: Gregory Caldwell of Lindridge in Worcestershire. And here's his winning entry for you to key in, using our Easy Entry system:



```
10 POKES3280,0:POKES3281,0:PRINT "[RED][G<Y]  
[G>E][G>D][G>C][G>F][G>R][G>@][G>R][G>F]  
[G>C][CYN]TASKSET[RED][G>C][G>F][G>R][G>@]  
[G>R][G>C][G>D][G>E][G<Y]";:BO TO10
```

The ten lucky runners up to receive a stack of Taskset goodies are: Jason Dobbs of Dyfed, P. Pearson of Huddersfield, S. Salisbury of Acomb Yorkshire, Andrew Saxton of Leicester, Angus McDonald of Perth, A. Brown of St. Austell, Jonathan Hardy of Oldham, S. Sherlock of Merseyside, Alun Howells of Rugby and Jim Gardner of Burton-on-Trent

To win your bumper package of top-quality American software, answer the three questions below and tell us — in not more than thirty words — what film you would like to see converted to a computer game, and why you think it would be a good choice.

(1) Raiders of the Lost Ark was directed by Stephen Spielberg, George Lucas, or Harrison Ford.
Answer.....

(2) What is Indiana Jones searching for in Raiders of the Lost Ark?
Answer.....

(3) Who created the character of Conan?
Answer.....

(4) Screen Conan, Arnold Schwarzenegger, has won the Mr Universe title once, twice, or four times?
Answer.....

The film I would most like to see converted to a computer game is

Name
.....

Address

Please supply software on cassette/disk when available
(please state which format you would prefer)

Rules

Entries should be sent to Commodore User, Superheroes Competition, Priory Court, 30-32 Farringdon Lane, London EC1R 3AU. They should reach the office no later than Tuesday 26th March 1985.

Instead of ten aliens, for his Commodore 64

What happened next?



Saturday morning.

Waltzed into my local computer shop.

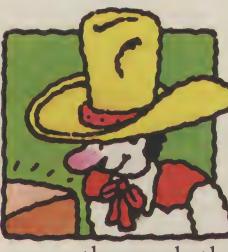
Packed as usual with masses of kids enjoying the arcade games.

Surely I could put my Commodore 64 to better use. Helpful assistant suggests a Commodore Communications Modem.

Tells me it comes with a year's free subscription to CompuNet, a new network service, saving me a cool thirty quid.

A bargain not to be missed, so I bought a Modem.

If I knew then, what I know now, I'd have thanked that assistant more.



Saturday (one week later).

Fantastic.

My CompuNet membership came through this morning.

Hurriedly plugged the Modem into my 64's cartridge port, and hooked up to the telephone line.

Can't wait.

At last I can communicate with other Commodore 64 Modem owners and giant mainframes.

What's more, I can also access databases



Sunday morning.

Raining.

Tapped in my CompuNet I.D. and personal password.

Wow, what a directory!

Decide to pit my wits against other Modem users by entering Multi User Dungeon, an interactive on-line game.

Should stretch the old grey matter a bit.

Then a quick look in 'The Jungle.' This is an open area where other Modem owners display messages.

See a Commodore user in Fife wants to sell 'U-boat' for £3.00.

Leave message offering him 'Mighty Gork' on a straight swap.



Monday evening.

Move on to the CompuNet Software Park.

What a choice. Loads of high quality bargain programs.

Particularly interested in educational software, so I call up 'The Study.'

Download free physics package to help with my exams.

Clive bought a Modem Commodore 64.



Next changed his life.



Tuesday evening.

Dad's turn.
I don't get a look in as he's
busy teleshopping.

Actually it's amazing what bargains turn
up. He even finds a new house.

Mum said she doesn't want to move and
anyway his dinner's getting cold.



Wednesday evening.

Discover I can join BLAISE*,
the computer service for
the British Library.

Their catalogue of books dates way
back to 1950.

Should give me an interesting edge over
my school chums.

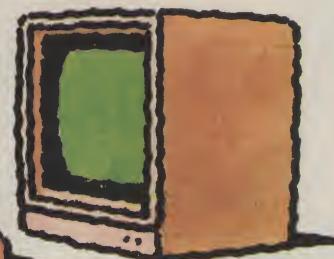


Thursday evening.

Sis has a go.
She keys into Prestel.*

Imagine, over 300,000 pages of information
and news.

What does she choose? The lonely hearts
section.



Friday evening.

Yippee! Receive a reply from
the guy in Fife.

He fancies taking on Gork.

What's more he's written a program he'd
like my opinion on.

He transfers it direct, using the free user
to user software.

I've made my first computer pal.
It has really been a week.

Best one I've had since getting my
Commodore 64.

Sure am glad I got the Modem instead of
all those aliens.

The Commodore 64 Communications
Modem comes as a complete package with a
year's free subscription to CompuNet, for just
£99.99 inc. VAT.

Find out how a Modem can change your
life. See it now at Dixons, Curry's, Comet and
selected Commodore dealers.

 **commodore**

For further information phone or write to:
Commodore Communications Modem,
1 Hunters Road, Weldon, Corby,
Northamptonshire NN17 1QX, Tel: 0536 205252.

*Require additional subscriber charges. Prestel is a
registered trademark of British Telecom.



BY APPOINTMENT YOUR MASTERS THE QUEEN
AND THE COUNTRY. BRITISH TELECOM
COMMODORE BUSINESS COMPUTER SYSTEMS

SOUND



EFFECTS WITH SID

Get to grips with hard sync and ring modulation

Ring modulation and hard synchronisation are two of the least used features of the SID chip — which is a shame because they'll let you produce really good sound effects. The concepts aren't difficult to learn either. They'll even let you produce four-note chords using only two of the 64's voices. So what are you waiting for?

by Tom Jeffries

First, it will help to know a little about sound itself. When you clap your hands together, the air that was between your palms is driven out and forms an area of compressed air. This area of compression travels outward in all directions, diminishing in strength as it goes. This is why sound gets softer as it travels farther — a hand clap that sounds quite loud at a distance of three inches can't be heard at ten miles.

Right behind the layer of compressed air there's an area of rarefied air — the extra air in the compressed area had to come from somewhere, so the area right next to the area of compression has a reduction in pressure. This area of rarefied air also travels outward in all directions, decreasing in strength as it goes. So far so good.

Your eardrum is designed to detect such variations in pressure. It is forced in slightly for the compressed air, and out again for the rarefied air. This movement is passed through various bones and fluids to nerves, which bring the information to your personal CPU (your brain) for deciphering. So, you can see why extremely loud noises can be dangerous — the eardrum, the bones, and the nerves have to be quite delicate to be sensitive to soft sounds; loud ones can cause damage.

Of course this description is somewhat simplified. Actually each different surface on your two hands sends out a slightly different "wave" of air. In addition, waves bounce off of the walls, floor, ceiling, and furniture and arrive at your eardrum a little later than the original waves. And that's how you get an echo.

Start making music

To get a musically useful sound, we generally want something a little longer than a handclap, and normally we want it to have a discernible "pitch". Both things can be accomplished by simply repeating the sequence of compressed and rarefied waves of air over and over again. The speed of the repetition determines what we hear as the pitch of the note.

Now, type in and listen to **Program 1**. At the beginning, the waves are slow enough that you can hear each one as a click; as they speed up you will be able to hear a low pitch which will get higher as the waves get faster. By the way, for a little insight into pulse waves, try changing **POKESID + 3.8** in line 30 to **POKESID + 3.2** and listen to the difference.

We measure the speed of the waves in cycles per second, each cycle being one compression and one rarefaction. You may have heard musicians talking about "A-440". This term refers to the international agreement that we will call the pitch produced when 440 compres-

sion/rarefaction cycles occur every second "A", and tune our instruments to that standard. Before this agreement was in existence, the music world suffered with a chaos of different standards similar to the one that plagues the computer world today.

The relationship between what our ear hears and the number of cycles per second is interesting. Whenever the number of cycles per second (called hertz) doubles, we hear the interval we call the octave. In other words, we would hear 220 cycles per second as an "A" one octave lower than the "A" at 440 cycles per second, and 880 cycles per second as an "A" one octave higher. The numbers you **POKE** into SID are calculated directly from the frequency of the note (number of cycles per second) by a rather straightforward formula which we can't go into here, but it can be found in Chapter 4 of the *Programmer's Reference Guide*.

Ring modulation made easy

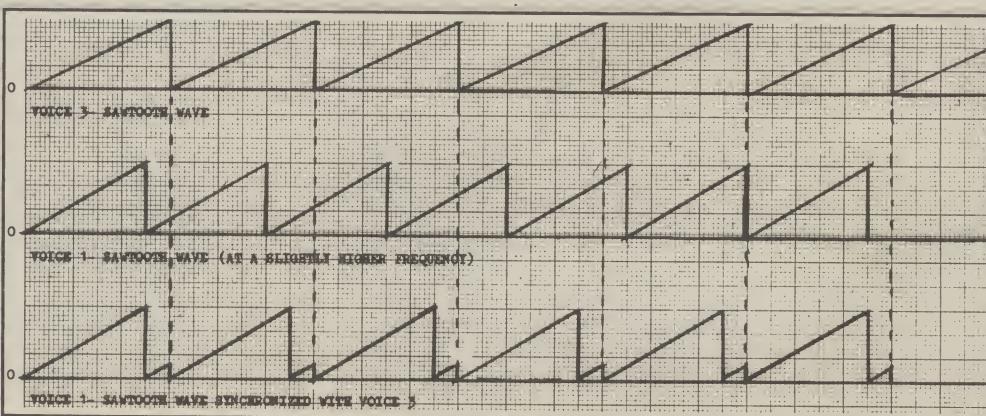
Now that you understand all

that, ring modulation is easy to explain. Non-electronic sounds tend to be very complex (more about that in my next article), and electronic musicians have tried ways to generate similar complexity in synthetic sounds. Ring modulation, and hard sync, are results of that effort.

Ring modulation is really just a mathematical operation. Quite simply, you take two different notes, add their frequencies to produce one new note, then subtract their frequencies to produce another new note. The original notes are supposed to be eliminated, but you can still hear them. Sounds a little odd, doesn't it? Nonetheless, that's how it's done. An example will make it clearer.

Look at **Program 2**. Line 40 sets two pitches: "C" above middle "C" and "F" five half-steps up. The "C" has a frequency of 523 cycles per second and the "F" has a frequency of 699 cycles per second. $523 + 699 = 1222$; $699 - 523 = 176$. A pitch table will tell us that we should hear a low "F" and a high "Eb" at those two pitches. Program 2 compares the sound produced by ring

Figure 1: Compression/rarefaction cycle in your loudspeaker.



SOUND EFFECTS WITH SID

modulating the original "C" and "F" to the sound of the resulting notes, low "F" and high "Eb", POKEd directly into the SID chip.

You will notice that the ring modulated sound is much richer; in fact if you listen closely you will hear all sorts of extra notes. Try POKEing SID + 18.17 instead of 16 in Line 50 and you will hear voice 3 also. As you can hear, it is possible to get more than three notes from the 64, and we aren't even using voice 2.

As you might guess, your Commodore 64 is not dealing with the actual waves in the air. As a matter of fact, all a computer can deal with is a series of numbers, so each wave appears to the SID chip as a series of numbers that go up and down in a regular pattern. A device called a "digital to analog converter" (DAC) converts these numbers into rising and falling voltages which go to an electromagnet that moves the cone of your speaker in and out, producing the compression/rarefaction cycle that we hear and call sound.

Program 3 is a sort of sampler of ring modulated sounds. Try changing the timing loop in line 60 to **FORT = 1TO1000** so you can hear each set of notes. As you can tell, with some careful calculation you can get a four-note chord from two voices.

Hard Synchronisation

I had read several contradictory definitions of "hard synch", so I decided to see if I could get a definitive explanation. First I called Commodore's customer relations department in the US, which claimed that Commodore had invented hard synch so the information I wanted was proprietary. They were quite dismayed when I informed them that most professional synthesisers had some form of hard synch, including the one that sits right next to my Commodore 64 in my studio. So here's my definition.

Hard synch is very simple. It establishes a master/slave relationship between two voices, so that whenever the master voice starts a cycle, the slave voice has to start its cycle over again no matter where it is in its own cycle.

```
10 REM: PROGRAM 1
20 SID=54272:FORL=SIDTOSID+24:POKEL,0:NEXT:POKESID+24,15
30 POKESID+3,8:POKESID+6,24B:REM SQUARE WAVE WITH FULL SUSTAIN
40 POKESID+4,65:REM GATE VOICE 1 ON
50 FORA=0T05:POKESID+1,A:REM HIGH BYTE LOOP
60 FORB=0T0255:POKESID,B:FORT=1T05:NEXT:NEXT:REM LOW BYTE AND TIMING LOOPS
70 NEXT:POKESID+4,64:END
```

PROGRAM 1

```
10 REM: PROGRAM 2
20 SID=54272:FORL=SIDTOSID+24:POKEL,0:NEXT:POKESID+24,15
30 POKESID+5,32:POKESID+6,24B:POKESID+19,32:POKESID+20,24B:REM SET ADSR
40 POKESID,135:POKESID+1,33:POKESID+14,193:POKESID+15,44:REM SET PITCHES
50 POKESID+4,21:POKESID+18,16:REM GATE VOICES 1 & 2 ON WITH RING MODULATION
60 FORT=1T01000:NEXT:POKESID+4,20:POKESID+18,16:FORT=1T0500:NEXT
70 POKESID,72:POKESID+1,78:POKESID+14,58:POKESID+15,11
80 POKESID+4,17:POKESID+18,17:REM NOW WITHOUT RING MODULATION
90 FORT=1T01000:NEXT:POKESID+4,16:POKESID+18,16:FORT=1T0500:NEXT
100 GOTO40
```

PROGRAM 2

```
10 REM: PROGRAM 3
20 SID=54272:FORL=SIDTOSID+24:POKEL,0:NEXT:POKESID+24,15
30 POKESID+6,24B:POKESID+20,24B
40 POKESID+18,17:POKESID+4,21:FORA=32T048STEP4:POKESID+15,A:
50 REM: FREQUENCY LOOP IN VOICE 3
60 FORB=0T0255:POKESID+1,B:FORT=1T0100:NEXT:NEXT:REM LOOP V1 & TIMING LOOP
70 POKESID+4,20:POKESID+18,16:REM SHUT OFF
```

PROGRAM 3

```
10 REM: PROGRAM 4
20 SID=54272:FORL=SIDTOSID+24:POKEL,0:NEXT:POKESID+24,15
30 POKESID+6,240:POKESID+20,240
40 POKESID,60:POKESID+14,50:REM SET FREQUENCY OF V1 A LITTLE HIGHER THAN V3
50 POKESID+18,33:FORT=1T04000:NEXT:POKESID+18,32:FORT=1T0500:NEXT:REM VOICE 3
60 POKESID+4,33:FORT=1T04000:NEXT:POKESID+4,32:FORT=1T0500:NEXT:REM VOICE 1
70 POKESID+18,33:POKESID+4,33:FORT=1T04000:NEXT:REM VOICES 1 & 3
80 POKESID+18,32:POKESID+4,32:FORT=1T0500:NEXT
90 POKESID+18,33:POKESID+4,35:FORT=1T0500:NEXT:REM V1 SYNCHED TO V3
100 POKESID+18,32:POKESID+4,34
```

PROGRAM 4

```
10 REM: PROGRAM 5
20 SID=54272:FORL=SIDTOSID+24:POKEL,0:NEXT:POKESID+24,15
30 POKESID+6,24B:POKESID+15,5:POKESID+1,5:REM SET VOICE 1 ADSR; VOICE 1 STARTS
40 REM: AT THE SAME PITCH AS VOICE 3
50 POKESID+4,35:FORV=10T0255:POKESID+1,V:REM START VOICE 1 WITH HARD SYNCH AND
60 REM: RAISE PITCH. NOTE THAT VOICE 3 IS NOT PRODUCING ANY SOUND.
70 FORT=1T030:NEXT:NEXT:POKESID+4,34:REM:YOU CAN GET SOME GREAT SOUND EFFECTS
80 REM: USING HARD SYNCH
```

PROGRAM 5

Type in Program 4 and look at Figure 1 while you listen. You'll hear a lot of funny tapping sounds. So what's happening?

Making waves

Look at the top line of Figure 1. It shows how the voltage going to your loudspeaker rises to a high, and then drops to zero, producing the desired compression/rarefaction cycle. The middle line shows voice 1 going through the same cycle at a slightly faster rate, which will produce a higher pitch. The bottom line shows what hap-

pens to voice 1 when it is in hard synchronisation with voice 3. It gets through one cycle and just gets started on another when it is forced to begin again with voice 3. Program 4 plays voice 3, then voice 1, then voices 3 and 1 without synch, and finally voice 1 synched to voice 3, with the pitch set very low so that each voltage peak produces a click: hard synch in slow motion. Program 5 shows some of the sounds you can get with hard synch. I have used sawtooth waves in these examples, but any wave will be affected by hard synch in the same way.

One additional note: with both ring modulation and hard synch, you have to look carefully to see what voice operates on what other voice, or you may not get what you expect. Appendix O of the *Programmer's Reference Guide* will tell you all you need to know.

Of course this is oversimplified; a complete discussion would take volumes. Just keep in mind that both ring modulation and hard synch are simply ways of making the sound output of your Commodore 64 more interesting and you won't go far wrong.

CLUB 64

THE INTERNATIONAL USER GROUP
For CBM64/1541 Users

If you are a CBM 64 user and you have a disk drive you are invited to join CLUB64.

CLUB64 is a unique user group and as one of our aims is to make quality Public Domain software available at the lowest Possible cost every member may order free of charge any 3 disks from our excellent library.

Most disks feature between 10 and 30 programs. There are many excellent utilities such as DISKVIEW which may be used to examine the contents of a disk, modify sectors, recover scratched files or scratch Protect files. FAST BACKUP may be used to backup a disk in less than 5 mins. We also have Games, Educational, Tutorial, Graphics, Music and COMAL disks.

Annual membership . . . £12 UK and Ireland. £15 Mainland Europe and £20 all other countries. We will accept cheques and Postal orders and it should be noted that we supply the blank disks.

For further details please contact Brendan Conroy at:-

85 Upper Drumcondra Road,
Dublin 9, IRELAND.

VIZASTAR 64

PACKAGE... AT AN AMAZINGLY AFFORDABLE PRICE! THE LATEST DESIGN TECHNIQUES COMBINE ULTIMATE EASE-OF-USE, WITH ALL THE SOPHISTICATION OF AN INTEGRATED PRODUCT... ADVANCED SPREADSHEET FEATURES INCLUDE HIGH-SPEED MATHS FUNCTIONS, 1000 BY 64 WORKSHEET, PROGRAMMABILITY, WINDOWS, CELL PROTECTION, SEARCH AND SORT, TEXT EDITING, WORDPROCESSOR COMPATIBILITY, SIMULTANEOUS GRAPHICS... INTEGRATED WITH A 1000-CHARACTER PER RECORD DATABASE, UP TO 250 CHARACTERS PER ITEM... THE ONLY PRODUCT OF ITS KIND FOR THE COMMODORE 64! SUITS MOST PRINTERS, SUPPLIED WITH EXCELLENT HANDBOOK.

OUR PRICE £99.95 £89.00



YOUR PROGRAMS
WILL REALLY
TAKE OFF WITH

DTL JETPACK 64! 100% COMPATIBLE WITH CBM BASIC. JETPACK COMPILES BASIC PROGRAMS INTO MACHINE CODE, RUNNING UP TO 25 TIMES FASTER... AND USING UP TO HALF AS MUCH MEMORY, TO GIVE FASTER LOADING, OR BIGGER PROGRAMS! AND IT EVEN ACCEPTS BASIC EXTENSIONS AND MACHINE CODE ROUTINES AS WELL!

OUR PRICE (DISK) £39.95 £35.95

Master 64

HAS EVERYTHING YOU NEED FOR PROGRAMMING TO TOP PROFESSIONAL STANDARDS! BASIC IV, MACHINE CODE MONITOR, AND 85 POWERFUL NEW COMMANDS... INCLUDING TOOLKIT, BUSINESS BASIC, KEYED ACCESS FILES, DISK DATA COMPRESSION, FORMATTABLE SCREEN ZONES, MULTIPLE SCREENS, DATE CONTROL, REPORT GENERATOR, 22-PLACE ARITHMETIC, SCREEN PLOT, SCREEN DUMP, AND MORE... ALL FOR ONLY £64.95!

VIZAWRITE 64

LOW-COST WORD PROCESSOR WITH ON-SCREEN FORMATTING, THAT TAKES FULL ADVANTAGE OF THE 64'S COLOUR, GRAPHICS AND MEMORY FEATURES... AND SUPPORTS VIRTUALLY ANY PRINTER! WITH A COMPREHENSIVE AND EASY-TO-FOLLOW USER REFERENCE MANUAL, VIZAWRITE IS THE ULTIMATE PERSONAL COMPUTER WORD PROCESSOR! AVAILABLE ON CARTRIDGE (£99.95 £78), DISK (£79.95 £68) OR WITH VIZASPELL (£99.95 £85)

*** WANT IT TOMORROW? *** CALL US TODAY! *** ON 01-546-7256

VIZASTAR	(DISK)	£99.95	£89.00	MULTIPLAN (US)	(DISK)	£79.95	£67.95
VIZASPELL	(DISK)	£99.95	£49.95	PRACTICALC	(DISK)	£44.50	£39.95
EASYSRIPT	(DISK)	£56.00	£55.00	PRACTICALC	(TAPE)	£39.95	£34.95
EASYSPELL	(DISK)	£50.00	£41.95	HOMEBASE 1-4	(SUPERBASE)	£17.95	
SIMON'S BASIC	(CART)	£50.00	£41.95	STEPPING STONES	(SUPERBASE)	£9.95	
FIGARO 64	(DISK)	£86.25	£75.00	PRINTLINK 64	(INTERFACE)	£29.95	

PRICES INCLUDE 15% VAT AND ARE
CORRECT ON GOING TO PRESS.
ORDER BY POST OR PHONE, USING
CHEQUE, ACCESS/BARCLAY CARD OR
OFFICIAL ORDER. DESPATCH IS BY
SAME-DAY 1ST CLASS POST, PRE-
PAID ORDERS FREE. PRODUCT DATA
AVAILABLE ON REQUEST. REF A31

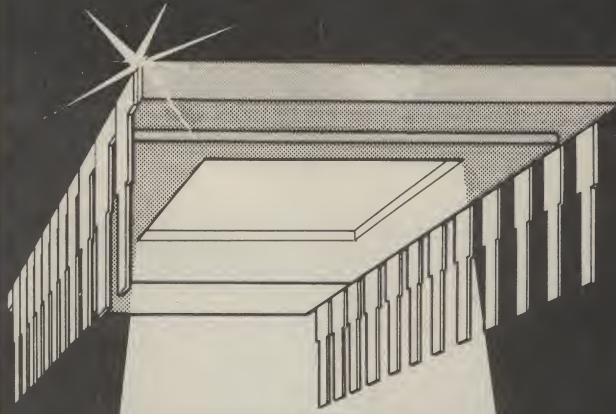


Calco
Software

LAKESIDE HOUSE, KINGSTON HILL, SURREY, KT2 7QT. TEL 01-546-7256

The Complete Machine Code Tutor

SPECTRUM 48K · COMMODORE 64 · BBC MODEL B · 32K ATARI



Trust New Generation to strip the mystery away from Machine Code. Now the Complete Machine Code Tutor makes learning machine code simple so there's never been a better time to discover the really great benefits of machine code programming - see what the press says:

“ A colourful, clear, interactive computer teaching package - the best I've come across in any field.
Jan Watterson - *Popular Computing Weekly* **“**

“ This pair of tapes forms a worthy addition to the range, giving a thorough exposition from the most elementary level of machine code programming on the BBC Micro.
Which Micro & Software Review **“**

“ The best machine code tutor and no serious Spectrum programmer should learn machine code without it.
Crash **“**

“ By far the best attempt comes from New Generation Software who has recently issued its Complete Machine Code Tutor for the BBC and the Spectrum.
Popular Computing Weekly **“**

“ New Generation have got a very nice product here. It's well thought out, easy to use, aesthetically pleasing, and (as far as I could tell) bug-free and crash-proof!
... "Overall then, an excellent idea, well executed.
Computing Today **“**

Supplied with full notes, this package teaches machine code the way it should be taught - at your own pace and actually from the microcomputer, not from a book. You learn programming the professional way, plus a few tricks of the trade. Available from all good computer stores at £14.95.



New Generation products are sold according to their terms of trade and conditions of sale.

FREEPOST, Bath BA2 4TD. Tel: 0225 316924

Selected titles of New Generation Software are available from your local computer store and larger branches of

WHSMITH / John Menzies / WOOLWORTH / SPECTRUM / Boots

Assemble with Butterfield

Jim Butterfield has written many utility programs and magazine articles (some in *Commodore User*) and is recognised as probably the expert on Commodore computers.

Machine Language for the Commodore 64 and Other Commodore Computers starts by assuming that the reader knows nothing about the computer hardware and explains the concepts of a data bus, binary and hexadecimal arithmetic and looks at the registers in the 6502 chip. These are explained with clear diagrams and short sections of three or four paragraphs.

The next three chapters expand upon the initial encounter with machine code into the areas of I/O, status flags and arithmetic. Particular use is made of the 'kernal' subroutines in all Commodore computers to simplify programming tasks.

Chapter five explains the ins and outs of addressing modes. This is one of the best descriptions I have seen anywhere. Apart from explaining how the modes work he also gives the why, as in why the Indexed, Indirect is hardly ever used or why indirect jumps are so useful with ROM routines.

The book becomes progressively detailed, in particular the sections on linking Basic with machine code. This looks at where to locate the code, interacting with Basic variables and the potential hazards of mixed Basic and machine-code programs. Then you're led into the real dirt of stacks, interrupts, peripheral chips and system wedges. As usual these are very well explained.

Finally, chapter eight discusses program timing, redirecting I/O and a summary of where you have got to. At this point we are not even half way into the book. Pages 147 to 326 are appendices A to J covering among other things machine code instruction listings, memory maps and ROM addresses, a listing of Supermon and reprints of technical data on I/O chips.

As you may gather I think that this is one of the best books on introducing machine code. It is a great shame that it fades out in

the middle. The appendices appear to have been added as padding, useful though they are, and I feel that the book would have been considerably improved by the addition of a "real" program and description.

Verdict: extremely well written and a good introduction but somewhat lacking in content. It could equally have been titled "Machine Language for the Vic-20 and other Commodore computers".

David Bolton

- *Machine Language for the Commodore 64 and other Commodore Computers*
- by Jim Butterfield
- Robert J. Brady Co. (A Prentice-Hall Publishing and Communications Company)
- £8.95
- well-written introduction



• Jim Butterfield •

Machine-code beginner

Machine Language for the Absolute Beginner is also aimed at beginners but differs greatly in presentation and content. It deals only with the Commodore 64. Mr Davis does not waste any time in getting to grips with machine language. A very short first chapter goes straight into subroutines and memory addressing. The next chapter looks at some of the addressing modes.

Chapter three slows the pace a little, it is concerned with teaching hexadecimal. This is in preparation for ALPA in the next chapter. ALPA is a Machine Language Monitor (MLM) written in Basic which lets you type in machine-language programs.

Using ALPA with lots of examples the book moves through simple arithmetic, control loops and index registers. All of the fundamentals of 6502 are covered up to interrupts which are men-

tioned but not dealt with. ALPA lets you type in lines a bit like Basic and all branches and JMPs are made to a line number of the desired instruction. ALPA works out the branch distance and this removes the cause of a large number of crashes in hand assembled code. The little example here shows the flavour of ALPA:

```
10 20L50 JSR L50
20 C9FA CMP £$FA
30 D0L10 BNE L10
40 60 RTS
50 EE00D0 INC $D000
60 AD00D0 LDA $D000
70 60 RTS
```

You type in the first bit, like 10 20L50, and ALPA displays JSR L50 to let you check your code. There are several commands to disassemble memory, move the program, load or save and run



Machine Language for the Absolute Beginner

Danny Davis

programs. But it does require you to work out the hex value for each instruction but after working through the examples you should be able to make use of a proper MLM which will do this for you. The example programs are no longer than 30 lines and are for particular aspects of the 64 like moving sprites or clearing a screen.

After 100 pages the book goes into appendices and covers the 6510 instruction set, hex to decimal conversion, calculating branches and brief explanations of the registers in VIC, SID and CIA chips. Also given is a memory map and list of ROM routine entry points plus a listing of ALPA.

Verdict: Learning from this book would be harder than from Butterfield's but the examples are at least relevant to the 64. For a complete beginner or the owner of a VIC/PET/C16/+4 I would recommend the Butterfield book first. If you have a 64 then Davis is probably a better choice.

David Bolton

- *Machine Language for the Absolute Beginner*
- by Danny Davis
- Melbourne House
- £6.95
- not for the complete beginner

Vic goes West

Raeto West, famous for his book *Programming the PET*, has now produced what looks like an even better book for Vic users. This book is ideal for all users from beginner to advanced programmer. The programs can be typed in without getting eye-strain and an automatic proof-reader is included as well, in one of the 17 appendices.

Apart from the usual stuff, the book includes aspects which have not been written about elsewhere: like how to use the random number generator, split-screen graphics, Basic extensions, and ROM cartridges to name just a few. The 17 chapters cover topics like Setting up, Basic, Tapes, Vic architecture, machine language, Vic & 64 comparison ROM listings, Graphics, Sound, Disk Drive, Games Port, Peripherals, Colour and much more, whilst the 17 appendices include numerous listings like Opcodes, VIC Chip Registers, Screen Locations, ASCII and much much more.

Graphics (chapter 12) illustrates the depth of approach: memory-map configurations are explained clearly, so you can select where to put Basic, where to put screen memory and where the machine language or user-defined graphics should go. Condensed lettering; the maximum possible screen; block saving and reloading data, are just a few topics written about. Nor is the beginner ignored as there are short Basic, easily-understood demonstration programs to whet the appetite.

I found the tape and disk sections most beneficial as not only were programs including machine language covered but also their storage on both media.

At £10.95 for over 600 pages packed with virtually all the information you are likely to need, this book must be a bargain. If you only buy one book for the Vic then this must be it!

Jennifer Goldsmith

- *Programming the Vic*
- by Raeto Collin West
- Level Ltd (Computer Publications)
- PO Box 438, London NW3
- £10.95
- recommended

Experience the thrill of
Formula One Motor Racing

ATARI

POKE

64

POKE

POSITION



This genuine reproduction of one of the worlds most popular arcade classics gives you the chance to experience the thrill of Formula One motor racing! Enter the practice

sessions. Race against the clock to qualify. Dice with other drivers for the lead. Only your skill and endurance see you to the chequered flag first!

CASSETTE £9.95 DISK £12.95



Premier Arcades™ from **Datasoft**

MATCH DAY

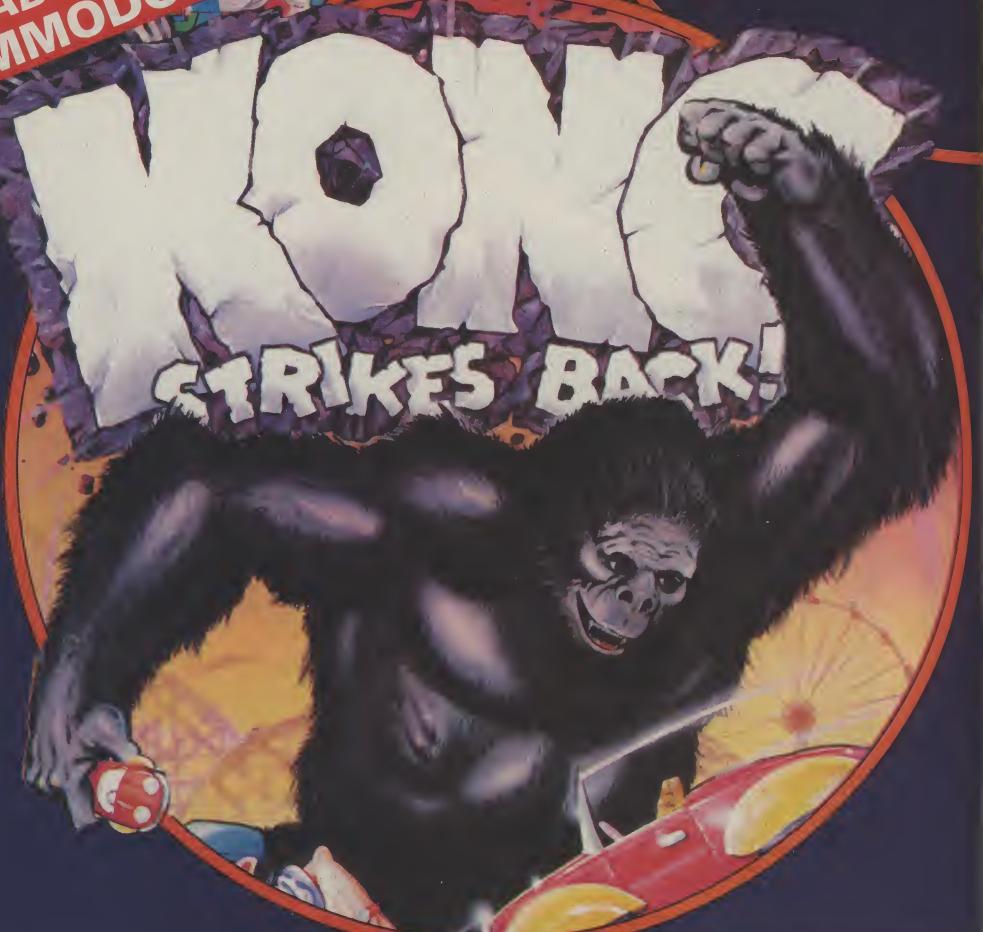


MATCH DAY
SPECTRUM 48K
7-95

— ★ —

KONG
STRIKES BACK
SPECTRUM 48K
6-90
COMMODORE 64
7-90

Don't
miss a
red-hot
with
OCEAN
WINTER



Ocean House · 6 Central Street · Manchester · M2 5NS · Telephone 061 832 6633

Ocean Software

OCEAN

Get you
all the
hot action
with
JEAN'S
GAMES



DALEY THOMPSON'S DECATHLON



HUNCHBACK II
SPECTRUM 48k

6-90
COMMODORE 64

7-90

—
DALEY THOMPSON'S
DECATHLON
SPECTRUM 48k

6-90
COMMODORE 64

7-90

ocean

Ocean Software is available from selected branches of:

WOOLWORTH, **WHSMITH**, **Boots**, **John Menzies**, **LASKYS**, **Rumbelows**, **COMET**,
Spectrum Shops and all good software dealers. Trade enquiries welcome.

DO MORE WITH YOUR COMMODORE

MAKE THE MOST OF YOUR COMMODORE COMPUTER WITH THESE BOOKS AND SOFTWARE – THERE'S SOMETHING HERE FOR EVERYONE.

COMMODORE 16

Gateway to Computing with the Commodore 16, Books 1 and 2
'Enter the gateway' and discover a new fun approach to computing and the 16 when you encounter a cast of colourful characters, problems, puzzles and projects. Start from scratch with Book 1 then develop your programming and other skills with Book 2. Ideal for the young – and young at heart!

£4.95 each/ Shiva Books/ Ian Stewart & Robin Jones

(Book 1: ISBN 1 85014 009X; Book 2: ISBN 1 85014 010 3)

Easy Programming: Commodore 16

Ideal for newcomers to computing, this book is a thorough and entertaining introduction to programming on the new C 16.

£5.95 Shiva Book/ Ian Stewart & Robin Jones (ISBN 1 85014 008 1)

Commodore 16 Machine Code

Covers every aspect of machine code programming on the C 16, from screen control and graphics to assembly language and debugging techniques.

£6.95 Shiva Book/ Ian Stewart & Robin Jones (ISBN 1 85014 012 X)

COMMODORE PLUS/4

Commodore Plus/4 Machine Code

Everything you need to know about machine code programming for the new Commodore Plus/4 – screen and keyboard control, moving graphics and colour – plus descriptions of all the facilities of TEDMON, the C Plus/4's built-in machine code monitor. Packed with simple programs and advice to help you develop your C Plus/4 machine code.

£6.95 Shiva Book/ Ian Stewart & Robin Jones (ISBN 1 85014 014 6)

COMMODORE 64 + VIC 20

Commodore Peripherals: A User's Guide

Want to add to your basic 64 or VIC system? Find your way through the peripherals jungle with this easy guide!

£7.95 Compute! Book/ Julie Knott & David Prochnow (ISBN 0 942386 56 6)

Compute! Commodore Collection Volume 2: Programs for the VIC and 64

£10.95 Compute! Book (ISBN 0 942386 70 1)

Compute! Third Book of Commodore 64

Outstanding games, applications, tutorials and utilities from Compute!'s magazine and Gazette – plus several never-before-published programs.

£10.95 Compute! Book (ISBN 0 942386 72 8)

Gateway to Computing with the Commodore, Books 1 and 2

'Enter the gateway' and have fun with your C 64 while you learn the secrets of successful computing!

£4.95 each/ Shiva Books/ Ian Stewart

(Book 1: ISBN 1 85014 017 0; Book 2: ISBN 1 85014 035 9)

Commodore 64 Programmer's Notebook

First-time users and experienced programmers – cut down errors and ease frustration with this programmer's answer guide, which fills the gap left between the Owner's Manual and the Programmer's Reference Guide and shows you how to master BASIC on the 64.

£14.95 HRW Book/ Earl Savage (ISBN 0 03 001294 5)

Mind Moves: Strategic Brain Games for the Commodore 64

Tired of playing arcade games? Looking for strategy games that will challenge and entertain you and your family? Look no further! The eight intriguing games in *Mind Moves* feature strategy, words, adventure, resource management, and much more.

£18.49 dilithium Press/ Book + Disk (ISBN 0 88056 225 0)

£18.49 dilithium Press/ Book + Cassette (ISBN 0 88056 228 5)

Golden Flutes and Great Escapes for the Commodore 64

Create your own games for the 64 with this straightforward guide – all you need is a small amount of BASIC programming knowledge. Four complete game programs are included, ready to run on disk or cassette – Golden Flutes, Great Escapes, Mars, and Treasure Hunt – with full explanations of how everything works. Check them out – then use the book to start programming your own adventure fantasies!

£18.38 dilithium Press/ Book + Disk (ISBN 0 88056 204 8)

£18.38 dilithium Press/ Book + Cassette (ISBN 0 88056 205 6)

Colour and Graphics for the Commodore 64

£13.95 HRW Book/ Andrew Veronis (ISBN 0 03 000052 1)

Compute! Reference Guide to CP/M on the Commodore 64 Volume 1

Everything you need to get the most out of Commodore's CP/M package and customise it to suit your own needs.

£11.95 Compute! Book/ James Doody (ISBN 0 942386 65 5)

Available from large branches of Boots, Menzies, W. H. Smith and bookshops, computer shops and department stores; or direct from the distributor by filling in the coupon below and sending it with your payment to HOLT SAUNDERS LTD, ACCOUNTS DEPT., 1 ST ANNE'S ROAD, EASTBOURNE BN21 3UN. Please make cheques payable to Holt Saunders Ltd and allow 28 days for delivery.

Free postage & packing on all UK orders

WRITE OR PHONE
FOR YOUR FREE
CATALOGUE

ORDER FORM

Please send me

ISBN	TITLE	QTY	TOTAL PRICE

I enclose payment of £..... by cheque or debit my credit card:

Amex Diners Club Visa Access (please tick)

Credit card number

Name (please print) _____

CU 3/85

Address

Telephone _____ Signed _____



Telephone credit card sales welcome – just dial 100 (UK only) and ask the operator for FREEPHONE 2568



COMPUTE!



dilithium
Press



Holt, Rinehart
and Winston

from HOLT SAUNDERS

A REGULAR SERIES

Whenever something big happens in computing, all the magazines pick up on it and write their own versions of the story. Such was the case, recently, over a couple of incidents regarding security at Prestel.

When a hacker penetrated Prince Philip's personal mailbox even the national press decided that this area of computing was interesting.

At a time when Prestel was still blushing from this embarrassing invasion of privacy, Timefame, one of the most widely-read information providers on Prestel, claimed it had been hacked again. Just a day after the first mega-hack.

MOLE MESSENGER

When hacking hit the headlines, Prestel published an announcement on its pages. As part of a routine security tightening, all information providers were to have their 10-digit IDs changed the following weekend. In fact, because of various blunders, the change was delayed.

However, when Timefame received its new ID numbers, the staff rang round all the Prestel computers to change their 4-character password. And when they dialled one particular computer, it said "Good Evening Timefame, you last used this computer at ..." and the date printed was that very afternoon. Some nasty hacker had discovered their new ID before even Timefame themselves!

What got the top people at Prestel annoyed was Timefame's reaction. The company wrote an article, saying that this incident surely indicated that there was a mole among Prestel's staff.

The story was closed to general user access and put in an area accessible only to Timefame and Prestel staff. Timefame gave Prestel two hours to reply, after which the story would be made public. Prestel didn't, so Timefame published. End of round 1.

DOWN THE PLUGHOLE

Round 2 started by Prestel sending Timefame a mailbox message by return. (For a change, the mailbox computer was actually working). Timefame had two hours to withdraw their statement, after which Prestel would terminate its contract with Timefame.

Everyone knows what happened next. Like others, I tried to access Timefame's pages that evening, only to find that they weren't there.

Prestel had pulled the plug. Prestel claimed that the hacker had used Timefame's old ID number, and had used their account just minutes before the ID was changed.

Timefame obviously didn't believe this, and Prestel declined to show them

the proof that they said they had. Actually, Prestel was right. I know for a fact that Timefame's new ID was not hacked, and that there is no mole within Prestel. (Now can I have my cheque please?!!)

Maybe the reason that Prestel refused to display the evidence was that people might have been surprised at how detailed it was. If you try to log on to the system and supply an incorrect password, you are disconnected. Details of who you were trying to log on as, and when, are recorded and sent to the mailbox of Prestel's security manager — automatically. If an information provider gets his editing password wrong, the same thing happens.

Oh, and you've probably read Prestel's various statements saying that they have no way of monitoring calls. Humbug, as they say. Prestel software can monitor either specific customers, or groups of customers who are members of any social group as specified on the application form. Like all those living in a certain area. Or all those whose bill increases by a large amount from one quarter to the next.

CompuNet still has its problems. Speed is important when you're linking

computers through the phone network, as time is money. I've been asking around via the Micronet Chatline for comparisons between the Prestel service and CompuNet. Commodore's system is much newer, which is both good and bad. It's good, because subjects like security have been discussed more. The main problem I've heard of with CompuNet is speed and availability. Sometimes, you dial up and the service is unavailable.

DAILY MAIL

One of Micronet's newer inventions is Chatline. You type in a message and a BBC micro automatically publishes your message for all to see within a few minutes. Recently, though, Prestel mailbox has been having problems. Complaints from customers, including myself, have flooded in to Prestel. Micronet even went to the point of publicly slagging off Prestel and telling them to pull up their proverbial socks. Surprisingly, though, Micronetters didn't back up the statement.

Instead, the Net received reminders from many of its subscribers warning them that a similar fate to that which befell Timefame could soon be applied to Micronet if they start to publicly discredit Prestel, though I doubt whether this would happen.

Electronic mail is gaining in popularity all the time. The Courier service on CompuNet is set to become popular, though it is quite expensive to use. Prestel mailbox is free, though frequently unavailable over the last month or two. The next few months should see the arrival of customised mailbox frames on Prestel. You design your own frame and Prestel turn it into a mailbox frame for you. Then, you can send your friends a personal message. Just like electronic headed note-paper.

TANDATA NEWS

Tandata have launched a new communications package for the 64. Supplied on disk for £34 + VAT, it enables you to spool incoming data direct to a disk file or the printer. It's compatible with various word-processors, so that you can send a word-processed file down the line to an electronic mail system like Gold. More details from Tandata via Prestel page 799 or Gold 81: TAN010. Now there's technology for you.

Finally, Micronet seem just as slow in updating their Commodore areas as they do for the rest of their database. In the last few months, subscribers have been treated to half a dozen hardware reviews and a handful of average feature articles. I'll be back next month, little yellow vans permitting.



by Robert Schifreen

What's on Micronet and CompuNet

BUSINESS STAR TURN

Vizastar, from Viza Software, is one of the new breed of integrating business packages that combines spreadsheet, database and graphics facilities. Clearly inspired by the massively successful Lotus 1-2-3 and its successor, Symphony, it proves that the Commodore 64 does have considerable business power — and that you can acquire powerful business software for just over £100. Karl Dallas gives an overview of the package's facilities and looks at a real time application for it in the transport industry. **By Karl Dallas.**

Vizastar is a programmable spreadsheet and database, one of a new breed of spreadsheets-plus whose inspiration is clearly taken from Lotus 1-2-3 and its successor, Symphony. But while 1-2-3 was written for the powerful IBM PC and its clones, requiring 296K of memory to run (and Symphony requires at

least 320K) this new mini-Symphony compresses similar power into the 30K or so available to the user of the Commodore 64.

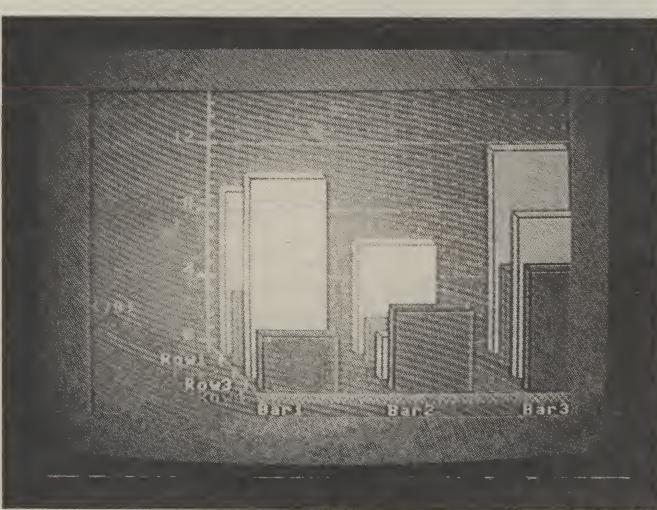
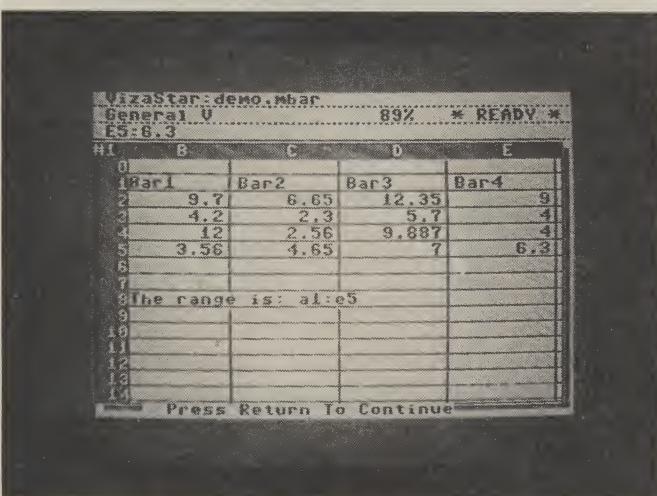
Of course, it can't offer the entire integrated package of spreadsheet, plus database, word-processor, graphics, and programmability. Trying to cram all four into the pint

pot of available memory would have invited the sort of compromises that made the Three-Plus-One ROM-based software of the Plus-4 such a disappointment. But it does add 4K extra memory in the cartridge that accompanies the disk (8K in the larger, XL8 version) and produces graphics as well as spreadsheet and database.

across and 999 down — and the database is a proper application, too, supporting up to 1,200 records on a 1541 drive. The number of records in a file is limited only by disk size (about 1,200 names and addresses on the 1541, about 8,000 on 8250), with up to 64 fields/9,000 characters per record, spread across nine screens. Average access time per record is claimed to be less than three seconds.

It actually uses a section of the notional sheet (rows 1000-plus), not otherwise available to the user, to store

Vizastar gives an impressive demonstration of its ability to generate colour graphics from data input to the worksheet. The example below shows a three-dimensional bar graph representing the data above. Line graphs can also be drawn.



The spreadsheet is of more than reasonable size — a maximum of 63,936 cells, 64

TRUCKING WITH

Despite all evidence to the contrary, the business power of the Commodore 64 is still undervalued. After all, it can't possibly compete with the irresistible force of the 16-bit IBM compatibles, and powerful spreadsheets-plus like Lotus 1-2-3. Or can it?

Well, meet Terry Palmer, a man who has tried 1-2-3 and found it wanting ... and prefers to recommend to his clients a 64 plus Vizastar, to achieve a better result at a rather lower price.

Terry Palmer is a transport consultant, and he says that most of the truck fleets in this country consist of around five vehicles. But most of the computer packages available for them are designed with the larger user in mind and cost over £1000, because they are aimed at fleets of 1000 vehicles or more.

Not surprisingly, few small fleet owners have got into computers so far, as Terry Palmer found when he conducted a survey sponsored by the Science and Engineering Research Council, so he set about devising a system that would make more commercial sense.

A cheaper alternative

Although he started developing it using Lotus 1-2-3, he ended up fitting it into the memory of the Commodore 64, using Vizastar, a programmable spreadsheet-cum-database program costing less than £100, compared with over £2000 for a complete fleet management and vehicle costing package, not including the hardware. In total, he estimates a software-plus-hardware cost of £1000, about a fifth of the total cost of the larger systems.

This is part of a project he is conducting in association with the Polytechnic of Central London to see if small truckers would find the information provided by such a system useful, and if they would be prepared to invest in it.

He started with the familiar log sheet that all truckers know, and produced report forms on which the truckers record all the jobs done, their journeys, destinations,

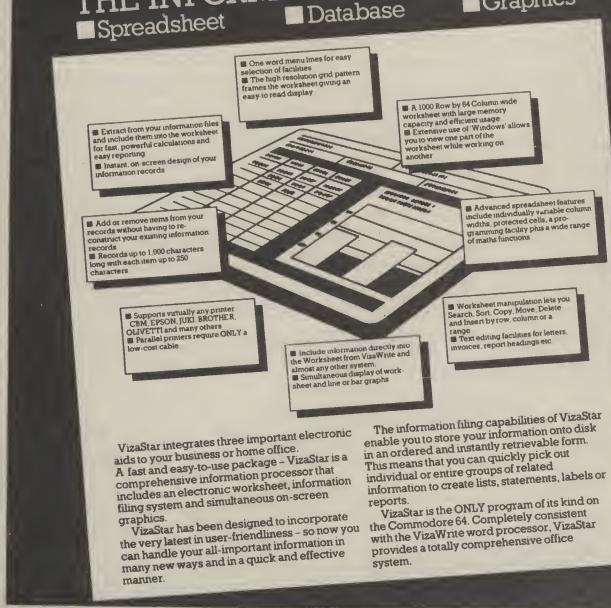
VIZASTAR 64

THE INFORMATION PROCESSOR

■ Spreadsheet

■ Database

■ Graphics



record formats. Each record can be accessed by Key or Next, Prior, First, Last or Current commands (each utilising the initial letter from a command menu). Records may also be Added, Replaced (modified), or Deleted.

The fields have letter names, starting with A and finishing with BK, which relate the columns of that name in the spreadsheet, so, for instance, search criteria can be set up on a blank line

of the spreadsheet. A is always the key field.

Writing with Vizastar

Although it does not contain a word processor as such, a blank worksheet could be used as a kind of document, since if more text is typed into a cell than properly can be displayed, then the surplus text will be displayed in any adjacent vacant cells.

With not too much difficulty, it would be possible to use this facility as a mini-WP. No string search or block move commands exist (though ranges of cells could be moved), but since Vizastar worksheets can be exported as sequential files and read by Vizawrite, any real formatting could be done under the

"proper" WP program. Likewise, Vizastar can also handle WP files generated by Vizawrite, or completely unrelated programs, like the Easy Script word processor.

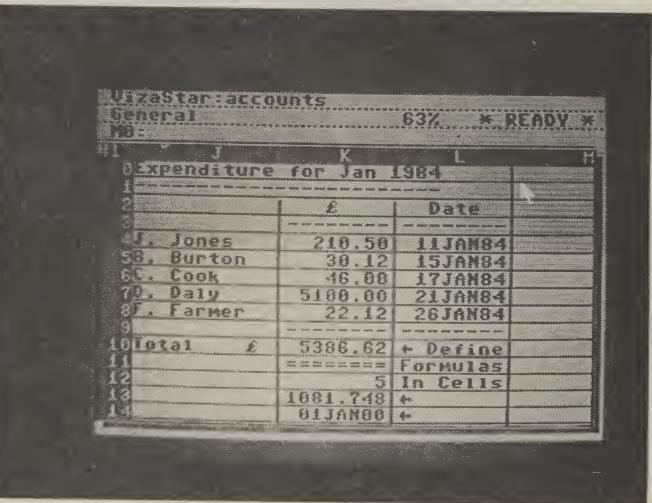
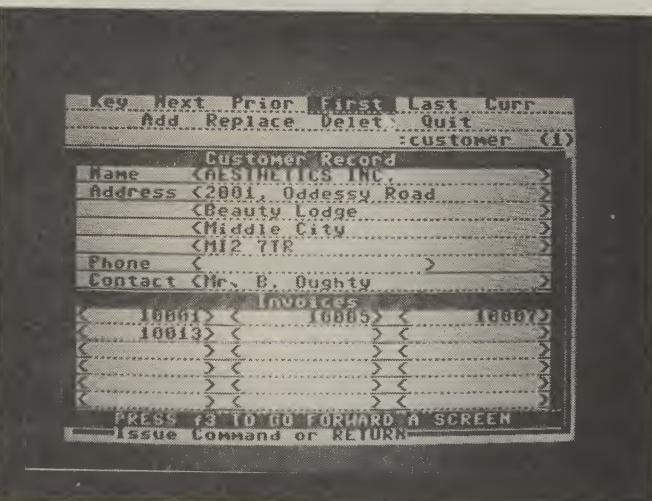
Since versions of Vizastar and Vizawrite are shortly to be made available for the 8296 (64 versions are already available in the 8050/8250 disk format), it would be nice if a fully integrated Vizastar/Write could be produced not unlike the Superoffice Superbase/Superscript combination from Precision.

Programming Vizastar

The other way in which Vizastar scores over all its competitors is the simplicity of its programming. This is not limited by any memory con-

A typical customer record layout on Vizastar's database. Each record can have up to nine 'screen-cards'.

Text, numbers and formulas can be entered on to the Vizastar worksheet which provides a maximum of 63,936 cells.



Compromises

Terry Palmer has had to make very few compromises to fit the program into the 64's memory.

"Actually, when I compare it with 1-2-3, I find the ability to program the sheet much easier with Vizastar," he says. "Of course, it is limited to the smaller operator: ten vehicles is the upper limit. But if I put all the data for one vehicle on a different disk, that allows me to cover an entire year on that one disk."

"Both 1-2-3 and Vizastar offer so-called graphics, but I find they're more of a gimmick than a useful option. But the main thing we seem to be proving is that the ordinary home micro has enough power to compete with the bigger business systems."

Terry Palmer's pilot project is still at a very early stage, but he is sufficiently confident in his provisional results to use them as the basis for lectures he is giving to transport users on how to computerise their businesses.



USINESS

QUIT

If "k" (for KEY) is pressed, the fields of the record will clear, and the name of the required file can be typed in, followed by <f1> to call it from disk.

When programming the spreadsheet, the oblique stroke "/" stands for the CBM key, followed by the initial letters of the menu commands. Function and other control keys can be included in the program by pressing <CTRL> followed by the key required. So the sequence of commands described above can be executed by typing in: /dakrecordname [f1]

If this is included in column A, then the program can be executed at any time by pressing <f8> (<SHIFT> + <f7>).

Normally, programs have to start at cell A0 (A-zero), but if Sheet Xec is pressed from the opening menu, this starting cell can be changed to anywhere on the sheet. This then becomes the Xec cell start unless it is changed with

another SX command, which can also be programmed.

In addition to its ease of learning — because once you've learnt the keystrokes, you can program them in by preceding the initial letters of the commands by the "/" symbol — this has some very powerful additional features, including GOTO LABEL, IF . . . THEN GOTO LABEL, IF END OF FILE THEN GOTO LABEL, PROMPT USER, WAIT, and QUIT commands, each of which are implemented by just two or three keystrokes.

Graphics

The graphics package supplied as standard is fairly simplistic (though much better than the Plus-4's) but I understand that the additional graphics program available on copyable disk (meaning it could be transferred on to all subsequent data disks) is rather more sophisticated. I have not seen this, however.

A few months ago, in noting that VizaStar was now

available, I criticised the manual, which I felt was poorly and confusingly written, with a number of errors and omissions, as well as having no index. Subsequently, an errata slip has been produced, but the best news is that the manual has now been rewritten, all the errors corrected, and an index supplied.

It's to be hoped that copies are sent to all registered users, as well as new users, since the poor manual was literally the only fault I could find with this excellent and powerful program.

Vizastar Programmable Spreadsheet
Viza Software
9 Mansion Row,
Brompton, Gillingham,
Kent ME7 5SE
£99.95
£129.95 with 8K ROM
expansion supplied on
disk (plus ROM
cartridge)

straints, and consists of simple initial-letter sequences from the spreadsheet's commands. To implement a "find" command in the database from the worksheet, for instance, the user must first press the CBM key to obtain the opening menu:

CELL SHEET FILE PRINT

DATA GRAPH

then press "d" for DATA, which produces the submenu:

ACCESS TRANSFER USE

SETUP OTHER

followed by "a" for ACCESS, which will reveal the first record on the file (if this is the first access), or the most recent record accessed. At the top of the record there is a two-line menu:

KEY NEXT PRIOR FIRST

LAST CURR

ADD REPLACE DELETE

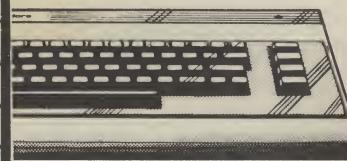
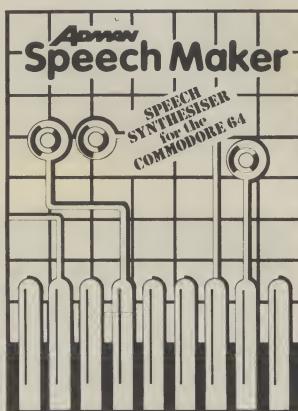
The Adman Speech Maker is a real conversation piece!

The Adman SPEECH MAKER makes writing programmes with speech really easy on the Commodore 64.

This latest synthesiser is pre-programmed not only with 234 set words and sounds, but also the 64 basic parts of English speech known as allophones, which can be used to build up your own limitless vocabulary.

The uses for this are endless — to give timed messages, for example, and to add an extra dimension to interactive educational programmes or adventure games.

It can also be used in conjunction with widely available programmes from some of the top software companies, such as the BJ and the Bear educational series (CBM), Twin Kingdom Valley (Bug Byte), Jack & the Beanstalk and 3-D Silicon Fish (Thor).



If you want a conversation piece for your Commodore 64, you'll find the Adman SPEECH MAKER at most good computer stockists.

Or simply order one direct from us at £29.95 with no extra charge for postage and packing!

**Dept. C, Adman Electronics Ltd., Ripon Way,
Harrogate, N. Yorks, HG1 2AU. Tel. (0621) 740972**

Adman Electronics Ltd. is a member of the Adam Leisure Group PLC

Please send me an Adam 64 speech synthesiser at £29.95

Name

Address

Cheques or P.O.'s should be made payable to
Adman Electronics Ltd. Please allow
28 days for delivery.

Adman
ELECTRONICS

SCREEN SCENE

Automan Commodore 64 Bugbyte Price £9.50

Presentation: Skill level: Interest: Value for money:

Automan, the game of the TV series, is well put together and of the high standard you'd expect from long established Bugbyte. In this episode the baddies have made an evil copy of Automan who zooms around Megacity planting bombs.

The first stage consists of a high-speed 3-D car chase through the streets of Megacity. At some point evil Automan

parks his car and runs off to plant his bomb in a building. You follow him into a Manic Miner style building, find the bomb and defuse it before it blows up. Evidence must also be collected at this stage in order to convict the creep behind it — affectionately known as The Lizard.

I especially like the dual scenario — two games in one really. Worth buying.



Hyper Biker Commodore 64 PSS Software Price £7.95

Presentation: Skill level: Interest: Value for money:

Track and field BMX style, the game consists of six race scenarios. In one you have to negotiate obstacles, another requires you to perform wheelies, then you graduate to more skillful tricks like the long jump and bunny hop. You can play against the computer or up to three friends.

Forward motion is accomplished by whacking the keyboard like a lunatic — beware! I

decided I would rather waste a joystick than smash my precious 64 to pieces, but it stood up to the pounding quite well.

The graphics are very well done — witness the perspective on the scrolling screen — objects in the distance move past more slowly than those in the foreground. The music is also excellent. For once I didn't find myself reaching for the volume knob. Great entertainment.



Witch Switch Commodore 64 English Software Price: £8.95/cass

Presentation: Skill level: Interest: Value for money:

Witch Switch casts you as a monkey who sets out on a perilous journey to the witches house where he must break a spell threatening the village with molten lava from the erupting volcano.

As you journey through the several stages of the game you can check the progress of the lava creeping ever nearer to your village by pressing the space bar to view the village scene.

There are seven screens (including a swamp, a poisonous lake, and demonic Ravens) to get through before you get to drop the pouch of magic powder into a cauldron to turn the evil witch into a good one.

English Software are beginning to set a very high standard of graphics and gameplay in their games and Witch Switch is no exception. Worthy follow up to the excellent Henry's House.



Water Ski 3D Commodore 64 Alligata Price £7.95/cass £11.95/disk

Presentation: Skill level: Interest: Value for money:

This waterlogged version of *Night Driver* or *Pole Position*, is like a gust of fresh, salty air.

The speedboat and tag-along skier are directly in front of you, obeying not only the promptings of your joystick but also centrifugal forces. As you race along, marker buoys show the way ahead while rocks and mountains scroll across the screen to aid the impression of skimming

around a circuit. The engine roars as you open the throttle but it's the wash of the sea spray whenever you "heel" into the briny that provides the right atmosphere.

Two shortcomings could cause irritation. The pixels along the edge of the sea shimmer and crashes are marked by an explosion which looks a bit pathetic. That apart, it's chart material.



Frak Commodore 64 Statesoft Price £8.95/cass £10.95/disk

Presentation: Skill level: Interest: Value for money:

Steer Neanderthal hero Trogg through the various screens, picking up the objects as you go in this platform type game from Statesoft.

You have to jump from level to level to gather the precariously placed objects. If monsters get in your way you can zap them with your Yo-Yo; this doesn't kill them but simply shoves them out of the way.

Watch out for the flying arrows and heat seeking balloons

which prove deadly on contact. When Trog dies a speech balloon comes out of his mouth and says 'FRAK'. I guess that's what troglodytes say when they die.

The graphics are bold and the game as a whole is a more than competent effort at a platform game, but for some reason it just didn't inspire me. Probably more fun on the higher levels (there are some 256 of them) if you can maintain interest long enough to get there.



SCREEN SCENE



Indiana Jones in the Lost Kingdom Commodore 64 US Gold Price £9.95/cass

Presentation:

Skill level:

Interest:

Value for money:

'Raiders of the Lost Ark' is a dream licence for a software house to base a computer game on.

It has everything. A super hero, non-stop action, a highly developed plot with lots of twists and turns, but above all it's big. Very big.

The game is not based on 'Raiders' or 'Temple of Doom'

but is a completely original challenge game with deliberately obscure instructions.

I found this a little frustrating and stumbled from screen to screen for ages, not knowing what was going on. Luckily I had a cheat-sheet from US Gold. This does not come with the game so don't lose this review-strategy guide.

Objective of Screen 1. Transfer the colour of the yellow, red, and blue balls on the left of the screen to the white balls on the right. To absorb the colours Indy simply has to make contact with each ball, cross back across the caverns using the lifts, and ward off the bats with his walking stick.

Objective of Screen 2. Indy has to rearrange the numbers on this screen. The numbers on the bottom of the screen must be



ACTION FREEZE

Top left: Shows screen three, a tough number challenge for Indy in a frozen cavern.

Top right: Screen five – Indy fights the Medusa.

Bottom: The final screen – Indy must collect the chalices.

made to match up with the numbers going from top to bottom on the left of the screen.

Objective of Screen 3. Another number challenge – this time you must complete a sequence of nine numbers in groups of three. When the ball is in the correct position it will turn black on the left of the screen. When all three balls have turned black you can go onto the next set of three.

Objective of Screen 4. This is the most difficult of the colour changing screens. All the col-



oured balls on the right of the screen must be turned white. The colour is obtained from the diamonds on the ledges. When Indy touches these with his cane the cane turns blue. He must now touch the blue ball with his cane, being careful not to let any part of his body make contact with any of the coloured balls.

Objective of Screen 5. Most arcade-like of the six challenges,



Seaside Special Commodore 64 Taskset Price £9.95/cass

Presentation:

Skill level:

Interest:

Value for money:

Computer games are being increasingly used for political propaganda. We've had Bruce Carver having a go at the Russians, feminists putting the case against sexism, and now Taskset pitch in to defend the environment with the long-awaited Seaside Special.

The idea of the game is to collect as much radioactive seaweed as possible, take it to Number Ten, and toss it at the

'Polystikians' who appear at the windows. The faces bear an uncanny resemblance to certain members of the Cabinet.

It's tough collecting that seaweed from the beach. You have to dodge the crabs, avoid being shot by the mutant, and watch out for the tide of contaminated water sweeping in and out. If you let the radiation level go into the red you'll drop dead. When you make it to Downing Street



The Staff of Karnath Commodore 64 Ultimate Price £9.95

Presentation:

Skill level:

Interest:

Value for money:

In the Staff of Karnath you play the intrepid Arthur Pendragon and have journeyed to the castle of the dead wizard Karnath, whose dying spell has shrouded the world under a cloud of evil. To break the spell you must find and destroy the staff hidden under an ancient obelisk by Karnath before his death.

The only way to gain entry to the obelisk is to find the sixteen pieces of a key in the shape of a pentagram, hidden throughout

the dozens of castle rooms.

Armed with a magic ring that can cast spells to ward off Karnath's henchmen you must learn to select the right spells.

When you find a piece of the key you must deposit it at the obelisk, being careful not to run out of energy as you battle past the numerous ghouls that congregate around the obelisk.

The graphics are impressive – especially the detail of beds, carpets, paintings, trunks, and

SCREEN STAR

Conan
Commodore 64
US Gold
Price £9.95/cass
£14.95/disk

Presentation:

■	■	■	■	□
---	---	---	---	---

Skill level:

■	■	□	□
---	---	---	---

Interest:

■	■	■	□
---	---	---	---

Value for money:

■	■	■	□
---	---	---	---

the fifth screen has you trying to get past the multi-headed medusa creature and then hack through the wall at the right of room one. You are now in the Bell Room. Tap the bell with your cane to activate the lift which takes you up to the next bell. This one and the bell will reappear on the floor and open a segment of the "door" between room two and three. You must strike the upper bell six times to get the door open completely. Room three is more of the same though trickier. More bells and an extra elevator.

Objective of Screen 6. Another arcade challenge here in a ledge-hopping, artifact-collecting final screen. You have to collect five chalices. Each time you collect one you have to go back to your starting position to make the next chalice appear.

Conclusion. I wasn't completely bowled over by Indiana Jones. In fairness to Mindscape it has to be said that trying to recreate the thrills induced the films on a computer is like Sinclair C5 against a Ferrari.

The game does have some strong points though — the combination of mathematical puzzles and arcade game-play is original, and Indiana Jones is recognisably the character from the film — even if he is a little small. Complete Indy nuts won't be able to resist this one — but if you want a real super hero game I'd choose Conan.

you have to score five direct hits to finish off a "Polytikian".

The game was programmed by Greenpeace supporter Tony Gibson, with graphics by Mark Harrison. Mr Gibson is considering making a donation to the environmental pressure group from his Seaside Special royalties.

Whatever your views on the environment you will have to admit this is a hellishly addictive game with superb graphics.

other objects in the various rooms. The moving characters are not quite as impressive as the background and in no way justify the description in the instructions of "cartoon quality". Sound effects are also disappointing.

On the plus side Karnath is highly playable — and you certainly won't want to put down the joystick until you've got inside the obelisk.

Arnold Schwarzenegger has recently been flexing his muscles — playing a robot in the new film 'Terminator' — but for real Arnold fans he will always be Conan.

Conan's ex-Mr Universe biceps first rippled on-screen when Arnold played the title role in the first film adaptation of the classic Marvel Comics character 'Conan the Barbarian'.

The film took more than a hundred million dollars at the box office and has recently been followed by a sequel in which he plays alongside Russell Harty-bashing Grace Jones in 'Conan the Destroyer'.

It was only a matter of time until a software house did a Conan game. Now the time has come with Datasoft's second game in their Famous Names series — called simply *Conan*, with Schwarzenegger's muscles bulging menacingly on the cover of the disk.

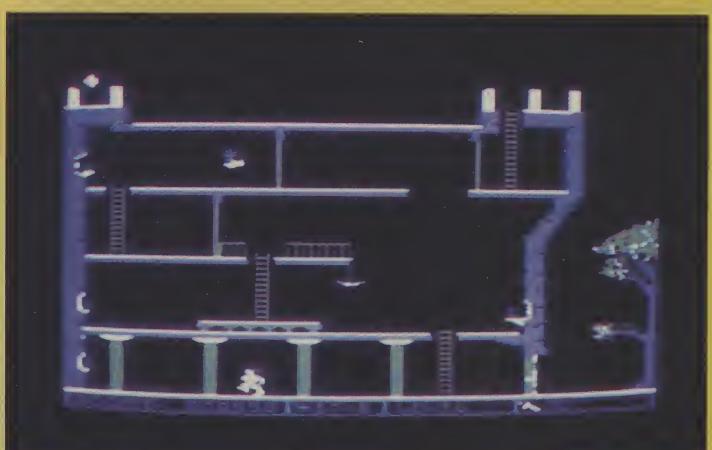
In the computer game Conan comes up against his most deadly rival — the evil Volta. The action takes place inside Volta's castle, filled with deadly traps.

Seven screens have to be completed, each filled with nasties like the fierce dragons, glowing flame monsters, giant floating eyeballs, electric spark creatures and lethal lepers. The aim on each screen is to find the gems, place them in gem holders, and find the key to unlock the door to the next level.

Just like Conan himself you can walk, run, jump, and fall from any height without injury — though you must be careful to avoid falling into pools of water, lava pits, fire pits, or the snake pit.

You are armed only with Conan's mighty sword which you can throw at your enemies to kill them and then catch again — boomerang-fashion on its return.

You begin the game with seven Conans and can earn an extra one for touching the bird on



ACTION FREEZE

Top: Conan sets out on his quest. Exit is top left hand corner. Conan must kill the swooping bird on this screen.

Middle: Screen Two. Exit is bottom left hand corner. The first key is shown bottom right.

Bottom: Conan must exit bottom left. The scorpion in the picture is deadly, our hero must get inside the transporter on the top platform.



certain levels and for really high scores.

The game is basically a multi-screen platform game — though with the real flavour of Conan. Screen One (pictured above) is the beginning of the game. Our hero has to get to the top of the castle and exit at the top left-hand corner of the screen whilst dodging the bird. You must use the sword on this screen — if you don't get that bird at the very start of your climb you'll never make it to the top. Screen Two introduces the first key — Conan has already claimed it in your picture — and the sharper eyed of you will be able to spot it in the bottom right-hand corner.

This was the most realistic of the three screens I cracked — jumping from great heights is as far as I could get in this pre-production

copy of the game given exclusively to Commodore User. Somehow you've got to get to the next level through the cavern in the bottom left-hand corner of the screen. If any of you ever manage it I'd love to know how it's done.

I can recommend Conan. It's a well thought-out climbing game that does justice to the excellent films and comics.

Conan is the second game in the Datasoft Famous Faces series — the sequel to the highly successful Bruce Lee.

The game is being distributed in the UK by US Gold of Birmingham, and should be available in most leading software shops.

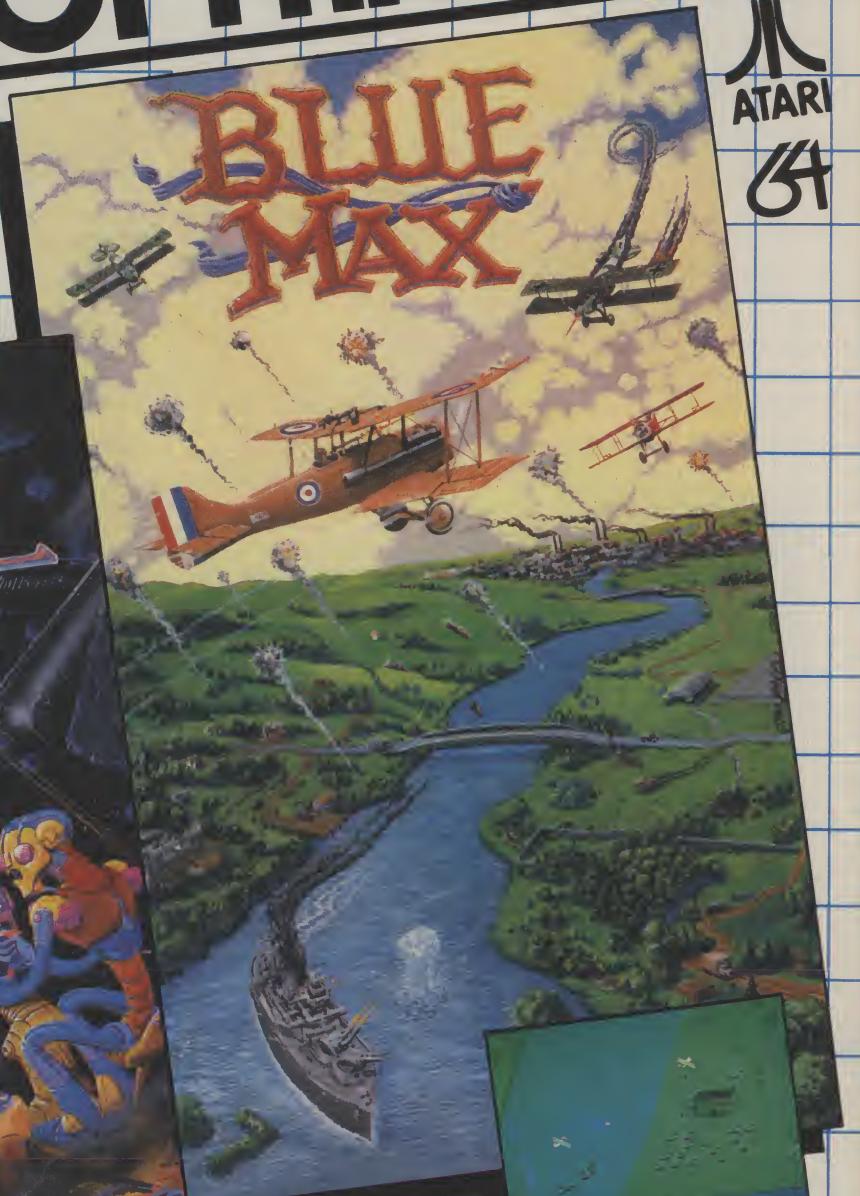
For your chance to win Conan and the rest of the US Gold range see our great competition on page 33.

First World War Aerial Combat...
Fantastic 'Point of View' Arcade Action...

FLIGHTS OF FANTASY

Exciting 3-D action makes SENTINEL the most realistic point-of-view game you've ever played. You're on a starship command deck with the latest in ultra-sophisticated computerised instrumentation. Use it to navigate through deadly asteroid belts, destroy enemy ships and track their battlestars through intergalactic minefields. Along the way you'll dock and refuel. It's tough duty but you've earned the command. Now can you prevent enemy forces from capturing your home planet? It's all in your hands.

Commodore 64.



ATARI
64



SELECTED
TITLES
AVAILABLE
SOON FOR
SPECTRUM

ALL GAMES
CASSETTE £9.95
DISK £14.95

U.S. Gold Ltd., Unit 10, The Parkway
Industrial Centre, Heneage Street,
Birmingham B7 4LY. Tel: 021-359 3020.

You're at the controls for this World War I dogfight game. Shoot down enemy planes, bomb targets, strafe tanks and gun emplacements - there's constant action on the incredible 3-D diagonally scrolling screen. At the same time, you have to keep track of altitude, speed, fuel and damage. Medals don't come easy. You must master a series of flying skills and perform them with pinpoint accuracy. One slip and you've lost it all - even your life. Happy landings, ace!

Commodore 64 and Atari.



A lively, imaginative alternative to rockets and bombs. Your Dreib builds squares; his enemies knock them down. Quick reflexes, intelligence and strategy are a must.

Commodore 64 & Atari.

One of the most challenging arcade games available! Incredible 3-D graphics, diagonally scrolling screen, super sound - all in great detail.

Commodore 64.

A multi-level extravaganza! Fire on hazards; negotiate deadly caves; rescue friends! Features superb graphics, unnerving sounds and a constantly scrolling screen.

Commodore 64 & Atari.

**U.S.
GOLD**
All
American Software

SYDsoft

SCREEN SCENE

F-15 Strike Eagle Commodore 64 US Gold

Price £14.95/cass
£14.95/disk

Presentation: ■■■■□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■□

Suicide Strike Commodore 64 System 3 Software Price £6.95

Presentation: ■■■□□
Skill level: ■■□□□
Interest: ■□□□□
Value for money: ■■□□□

Congo Bongo Commodore 64 US Gold

Price £9.95/cass
£11.95/disk

Presentation: ■■□□□
Skill level: ■■□□□
Interest: ■■□□□
Value for money: ■■□□□

Shoot The Rapids Commodore 64 New Generation Software Price £9.95/cass

Presentation: ■■■■□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■■□

1984—The Day After Commodore 64 Mastertronic Price £1.99

Presentation: ■■■□□
Skill level: ■■■■□
Interest: ■■■■□
Value for money: ■■■■□

Fifteen sovs is a tidy sum to shell out for any game, even if a 'Flight Manual' is included. The knowledge that this hi-tech, strike aircraft simulation hails from Micro Prose is the sugar coating on a bitter pill.

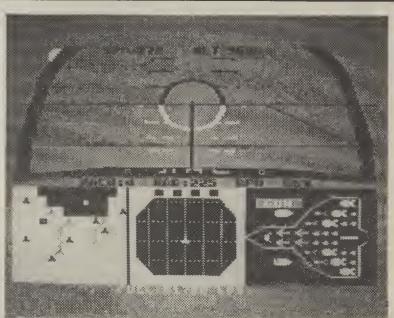
The first half-an-hour spent in the cockpit was agonising... fumble, fumble, fumble... what's more the listed dual joystick controls seem to be for the Atari. Yet after delving into the manual a few times things

began to fall into place with the result that I can happily recommend this offering to rich, flight-simulation fans.

As with every program of this type, the view from the 'window' is sketchy by arcade-game standards, but up to par.

You must deal with interceptors through seven missions and four levels of play.

There's enough complexity and depth to satisfy developing, would-be fighter pilots.

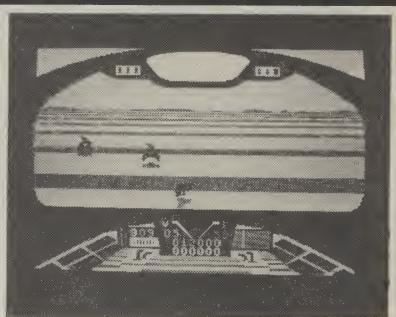


Though it's against my nature I'm going to try and be positive about this game. On the back of the box is stamped 'From America', as if this were some cast iron guarantee of quality.

Personally, I wouldn't touch Suicide Strike with a barge pole. But don't take my word for it, judge for yourselves. You are presented with a flash looking cockpit and a view of the landscape beyond — not bad

graphics here. What actually moves when you tweak the joystick is a little plane at the bottom of the screen, this has complete side to side mobility and will move up the screen about one centimetre. First you are attacked by a wave of helicopters, then tanks, then jets, then you begin to feel drowsy and are overcome by a deep sleep.

Space invaders with frills. So much for being positive.



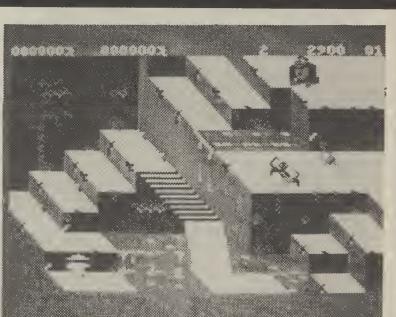
Congo Bongo what's gone wrong. The game was merely a minor success in the arcades when it was launched by Sega eighteen months ago. And a minor hit is all it's likely to become on the 64. Pretty graphics and jolly jingles are no substitute for a basic lack of game-play.

Congo Bongo is another game based on the now extremely hackneyed jungle safari theme. Just two screens of mediocre ac-

tion. The first challenges you to climb to the top of some ramparts dodging the coconuts being lobbed by the ubiquitous ape at the top of the screen — easy peasy, took me about five minutes.

Screen two is no more than a 3D Frogger — again quite pretty to look at but you should be able to do it with your eyes closed.

The game is really only suitable for children. Experienced games players need not apply.



Water sports seem to be all the rage at the moment with two splash-splash games reviewed this month.

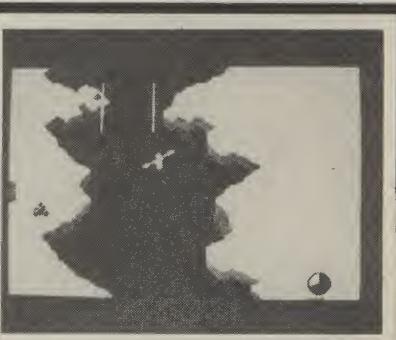
Canoeing can be a tricky business at the best of times and the addition of a 64 makes it no easier. To paddle your computerised canoe you move the joystick from left to right — Decathlon-style.

The key to Shoot The Rapids is to get into a nice steady rhythm. Thankfully you don't need to

shake the living daylights out of your joystick to build up speed.

Added complications are the clock that ticks away as you struggle to get your kayak through the barriers, the motor launch that appears on later screens, and the beaver who bobs up and down.

A good deal of technique is required to paddle the canoe and get it around the bends in the river. Full marks to New Generation for a highly playable game.

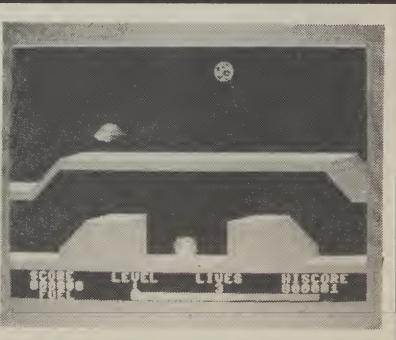


No flight manual, no convoluted scenario, no hideous aliens, no classical music. But they are not missed in this test of dexterity where you coax a rocket through tunnels and over the contours of stark, scrolling landscapes by delicately prompting the thruster motor.

Apart from the rocks there is a pressing need to avoid saucers from RentalUFO and shells from sentinel guns situated to defend energy deposits. You mustn't

touch anything... use the tractor beam to suck in the pink parcels whilst hovering, then off to the next deposit.

The sole, addictive, quality of the game (very well exploited) is the essential precision manoeuvring of the rocket, achieved by marrying bursts on the thruster with keen directional control. If you already have a "Lander" program you probably won't want this; otherwise at £2' it's a must.



COMPUTER & VIDEO GAMES YEARBOOK



Available at
your newsagent
Only £2.65 now!

SCREEN SCENE

Roller Kong Commodore 16 Melbourne House Price £5.95

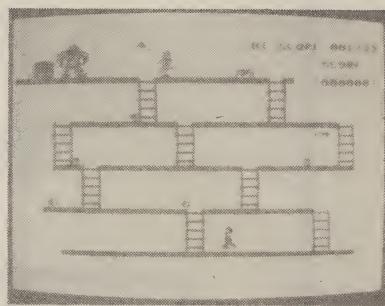
Presentation: ■■□□□
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■□□□

Whenever a new machine hits the High Street the first games to follow always seem a little disappointing simply because you can't expect programmers to know a machine inside out within a few weeks of unwrapping it. But I suspect software houses are a little too eager to get games on the market first at the expense of quality — no competition is good competition as they say.

Roller Kong is regrettably no

exception to the above rule. In the umpteenth version of the classic arcade original you control our hero and attempt to rescue his enfeebled mate from Kong's evil grip. Negotiate your way from the bottom of the screen to the top via a number of platforms connected by ladders and lifts.

The below average graphics and sound and general lack of anything exciting or original make this one worth passing



Flight Path 737 Anirog C16 Price £6.95

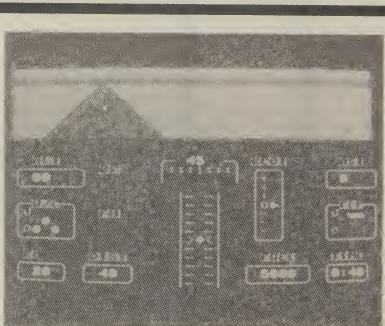
Presentation: ■■■■□
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■■□

Flight Path 737 has you sitting on the runway in the inevitable 'high performance jet airliner' making your final preparations before take-off.

A few basics to remember here such as pointing your nose in the right direction and putting the flaps down. This accomplished you can whack up the power to full throttle, scream down the runway and execute a perfect take off into the cloudless sky above — hopefully avoiding the

mountains conveniently situated a stones' throw from the departure lounge.

There are six skill levels, ranging from first solo to test pilot. As you progress life is made more difficult by higher mountains, shorter runways, cross-winds, and engine fires. I would say this is more of a game than a so-called serious flight simulator. Poor graphics detract from the feel of reality. Good fun for those with no allusions to the real thing.



Psychedelia Commodore 16 Llamasoft Price £6.00

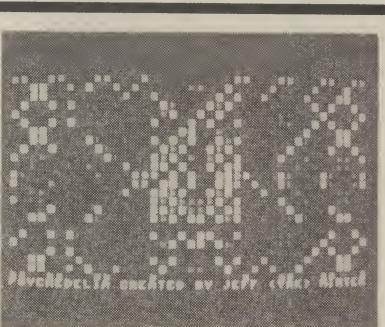
Presentation: ■■■■■
Skill level: N/A
Interest: N/A
Value for money: N/A

Congratulations to Jeff Minter for the most original piece of software I think I've ever seen. *Psychedelia* is a kind of cosmic kaleidoscope. The idea is to switch the lights off, stick your favourite record on the turntable, and freak out to your own light show.

Using a joystick with the fire button depressed, you move the cursor around the screen in whichever direction takes your fancy. This causes one of the

preset patterns to flow, twist, and leap across the screen with startling results. It's really quite beautiful! There are sixteen preset patterns in all which you can define yourself once you get the hang of things.

Other parameters such as symmetry, cursor speed and pulse width can be altered to create special effects. When a pleasing result is obtained it can be recorded and played back. Impressive stuff.



Villain VIC 20 (+8K) Interceptor Price £6.00

Presentation: ■■■■■
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■■□

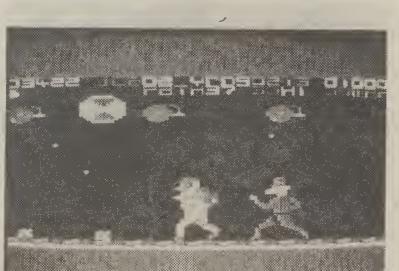
I've got one of those miserable, standard issue Commodore joysticks plugged into my Vic, so I'm not too worried about the pounding it'll receive from this program. If you have cast longing glances at the athletic games on the 64 and fancied doing a bit of sprinting, well this is a cops-'n'-robbers chase where you have to be very fast off the mark.

Great, you've qualified for job

number 1, where you have to outrun the Bill over 1,000 paces.

Before the next level there is an exhausting interlude; just see how far you can run before the Boys in Blue nab you. The action gets more and more involved and your joystick hand will get weaker and weaker.

Excellent sound, graphics, game play and general conception overall. You may tire physically but boredom will not be a problem.



Front Line Commodore 64 Joystick only Interceptor Price £7.00

Presentation: ■■■■■
Skill level: ■■■□□
Interest: ■■■□□
Value for money: ■■■■□

You've been silly enough to volunteer for a ludicrously testing and highly unlikely mission. That is, to deny the allied supply dumps to the rampaging enemy.

You need to whisk round a fair sized island (only a small section appears on the screen at a time) in the latest armoured vehicle, dividing your time between wiping-out fuel dumps (stocking up with shells and armour plating

while you're about it) and engaging the enemy.

Physical features, trees etc., can't be blasted away, so you have to trundle around them and as the tank isn't amphibious, river crossings can only be made by seeking out bridges.

Pictorially the program features a bird's eye view of the battleground with all the characters easily recognisable.

Prepare to engage enemy.

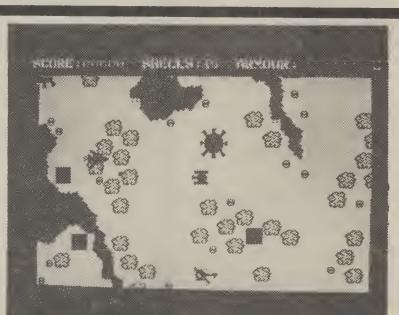


CHART HITS OF 1984

TOP 50 SOFTWARE

	Title	Publisher	Highest Position	Weeks in Chart
1	Beach-Head	Access/US Gold	2nd	15
2	Daley Thompson's Decathlon	Ocean	1st	9
3	Hunchback	Ocean	2nd	8
4	Hungry Horace	Ocean	7th	8
5	Manic Miner	Software Projects	1st	8
6	International Soccer	Commodore	2nd	12
7	Space Pilot	Anirog	6th	9
8	Decathlon	Activision	3rd	7
9	Valhalla	Legend	6th	6
10	Flight Path 737	Anirog	11th	7
11	Select One Games	Computer Records	7th	5
12	Aztec Challenge	Comi/US Gold	10th	6
13	Hobbit	Melbourne House	8th	12
14	Monty Mole	Gremlin Graphics	10th	6
15	Jet Set Willy	Software Projects	7th	4
16	Tales of Arabian Nights	Interceptor Micros	10th	6
17	Return of the Mutant Camels	Llamasoft	10th	4
18	Ghostbusters	Activision	1st	2
19	Blagger	Alligata	16th	8
20	Death Star Interceptor	System 3	11th	3
20	Son of Blagger	Alligata	12th	5
22	Zaxxon	Access/US Gold	13th	3
23	Pilot 64	Abbex	16th	5
24	Twin Kingdom Valley	Bug Byte	19th	4
24	Crazy Kong	Interceptor Micros	14th	3
26	Raid Over Moscow	Access/US Gold	5th	1
27	Suicide Express	Gremlin Graphics	16th	2
28	Super Pipeline	Taskset	13th	2
28	Micro Olympics	Data Base/Micro User	10th	1
28	Astro Chase	State Software	14th	2

GENERAL CHART

	Title	Publisher	Computer	Highest Position	Weeks in Charts
1	Jet Set Willy	Software Projects	Spectrum	1st	19
2	Fighter Pilot	Digital	Spectrum	2nd	16
3	Beach-Head	Access/US Gold	C64	2nd	15
4	Manic Miner	Software Projects	Spectrum	2nd	16
5	Sabre Wulf	Ultimate	Spectrum	1st	10
6	Daley Thompson's Decathlon	Ocean	C64	1st	9
7	Daley Thompson's Decathlon	Ocean	Spectrum	1st	8
8	Code Name Matt	Micro Mega	Spectrum	3rd	12
9	Trashman	New Generation	Spectrum	5th	11
10	Full Throttle	Micromega	Spectrum	2nd	10
10	Tornado Low Level	Vortex	Spectrum	2nd	10
12	Night Gunner	Digital	Spectrum	3rd	11
13	Chequered Flag	Sinclair	Spectrum	2nd	12
14	Psytron	Beyond	Spectrum	3rd	10
15	Hunchback	Ocean	C64	2nd	8
15	Hungry Horace	Ocean	C64	7th	8
17	Manic Miner	Software Projects	C64	1st	8
18	Lords of Midnight	Beyond	Spectrum	6th	10
19	Hunchback	Ocean	Spectrum	4th	8
20	Elite	Acorn	BBC	2nd	6

These charts were compiled by EMAP Market Research from 1984 NOP Market Research Charts as printed in the Daily Mirror and Computer and Video Games magazine

If you're into program writing....

Get this into an envelope

If the programs you are writing involve sophisticated graphics, you have two choices, a severe headache or Touchmaster.

Obviously you'll want to consider the matter, so in the mean time send away for your free Touchmaster literature and find out more about the best value/performance graphics tablet available... or take two pain killers!

TOUCHMASTER
 Touchmaster Limited, PO Box 3,
Port Talbot, West Glamorgan, SA13 1WH.

To Touchmaster Limited, FREEPOST, Port Talbot, West Glamorgan, SA13 1ZZ.

Please send me free Touchmaster literature.

CU/3/85

Name

Address

Make of
computer

CHROMASONIC

Computer Centres

48 Junction Road, Archway, London N19 5RD. Tel: 01-263 9493/5

238 Muswell Hill Broadway, London N10 3SH. Tel: 01-883 3705

WELCOME TO THE WORLD OF COMMODORE

Maintenance, Service, Support, Training
all from you No 1 Commodore centre.

64 BUMPER PACK
contains: 64, C2N, Joystick
Simons Basic
(114 extra commands)
International Soccer cart.
Programmers Ref Guide
CBM Sports Bag
All for **ONLY £295.00**

Commodore 64 guaranteed for 2 years

COMMODORE 64

PROFESSIONAL SYSTEM

Commodore 64
1541 Disk Drive
MPS-801 dot matrix printer
FREE SOFTWARE
Easy Script (wordprocessor)
Easy-file (database)
Introduction to Basic (part 1)
FREE MEDIA
Box of 10 disks
Box of paper
ONLY £599.00

PLUS 4

Built in software: word/pro, data
base, spreadsheet, business gra
NOW ONLY £149.00

COMMODORE64

STARTER PACK

Commodore 64 computer
cassette unit
Intro to Basic part 1
Quickshot II joystick
A game of our choice
ONLY £255.00

64 SOFTWARE

	cass disk	Superbase 64	cass disk
Flight Simulator II	35.95 42.95	Superbase 64	
Stellar 7	9.95	Anagram Sales Ledger	75.00
Raid Over Moscow	9.95 12.95	Purchase Ledger	75.00
Combat Leader	9.95 12.95	Cash Book Ledger	75.00
Battle for Normandy	14.95	Gemini Mailist	19.95 24.95
Designers Pencil	11.95	Home Accounts	19.95 24.95
Sentinel	9.95	Final Accounts	59.95 64.95
Raid on Bungeling Bay	9.95	Stock Control	19.95 24.95
Ghostbusters	10.99	Easyscript W.P.	69.00
Spirit of the Stones	14.99 14.99	Calc Result (easy) ROM	49.95
		(advanced) ROM	99.00

CMB64 — Epson Int £61.99

Monitors

Commodore 1701	£195.95
Microvitec 1431AP	£246.10
Phillips 12" green	£79.35
64-Phillips cable	£2.50
Monitor plinth	£11.50

MODEM & SX64

Complete portable system for
anybody on the move complete
with FREE software and 1
year's sub to Compunet.
**Special deal price
ONLY £695.00**

PRINTERS

RX80T	£241.50
RX80F/T	£274.85
RX100	£442.75
FX80	£399.95
FX100	£557.75
DX100	£471.50
LQ1500	£1092.50
Juki 6100	£399.95
Daisystep 2000	£263.35
Ibico LTR-1	£228.85
64-centronics	£19.95
Software for above (cass)	£7.95

Terms

All products are guaranteed for 1 year
unless otherwise stated. Payment may be
made by Access, Barclaycard, Bankers
Draft, Building Society cheque, cash or
postal order. Sorry cheques need five
days for clearance. We reserve the right
to change prices without prior notice.

All prices are inclusive of VAT.
Please check before ordering for carriage
charges.

MEDIA SUPPLIES

Disks by Verbatim		
SS/DD 40Tr	£17.95	SS/DD 80Tr £24.75
b DS/DD 40Tr	£28.92	DS/DD 80Tr £32.75
Lockable disk storage boxes 40/80	16.50/25.25	
Disks are supplied in boxes of 10		
Computer listing paper		
11x8.5 13.80	11x9.5 12.65	11x15 ^{5/16} 15.52
Paper is supplied in boxes of 2000 sheets		
Printer ribbons		
MPS-801 6.99	RX80/FX/80 5.00	Daisystep 5.50
MPS-802 7.99	1515/1525 6.25	Juki 1.85
We also supply a range of dust covers, daisy wheels and other ribbons.		

HOT
FROM

SEGA®

THE ARCADE WINNERS

released
NOW

SPY HUNTER

THE OFFICIAL HOME VERSION OF
BALLY MIDWAY'S ARCADE HIT

- You control the turbo charged race car/hydro spy boat.
- You control a deadly arsenal of missiles, machine guns, oil slicks and smoke screens.
- Sophisticated spy-challenging graphics.

U.S. Gold is stocked by

Boots / John Menzies, WILDINGS
WOOLWORTH, WHSMITH,
Rumbelows
and Spectrum Shops



64 COMMODORE CASSETTE 9.95
DISK 12.95

SPECTRUM CASSETTE 7.95



Exclusive manufacturers for
SEGA and Bally MIDWAY.

For release schedule and trade details contact:

Centre Soft, Unit 10, The Parkway Industrial Centre, Heneage Street, Birmingham B7 4LY. Telephone: 021-359 3020. Telex: 337268.

NOW
PROGRAMMING

YOUR HOME
COMPUTER

IS AS EASY

AS READING
THIS.

Let's face it, most 'beginner's guides' are anything but easy reading.

Now Dorling Kindersley have come up with a new way of learning BASIC that's unique, simple and down-to-earth.

It's called 'Screen Shot'.

Unlike ordinary guides, Screen Shot uses full-colour photographs of real computer screens to show instructions, program listings and displays.

So what you see on the screen in the book is precisely what you'll see on your own computer screen.

Which makes our programs easy to understand, easy to read and free from misprints or other sources of confusion.

The accompanying explanations are clear, practical and are written by experts.

You'll find there are Screen Shots for most popular makes of home micro.



Books 1 and 2 of each series form a complete guide to BASIC programming for that computer.

For the more adventurous programmer, Books 3 and 4 explore the creative world of computer graphics.

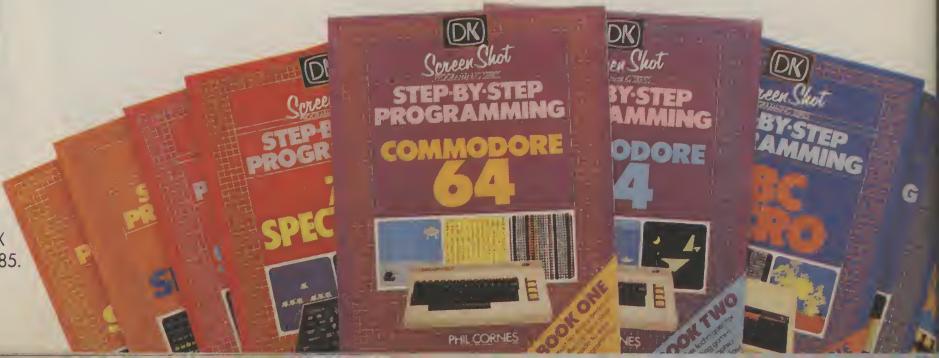
In the words of a reviewer in 'Big K' magazine, Screen Shots are "...clearly and expertly written with the best layout I have seen in a book of this sort...what you see is (for once) what you get. Outstandingly good and for beginners or semi-beginners: highly recommended."

The message is clear. If you really want to get into programming, get a Screen Shot.

With anything else, you won't be fully in the picture.

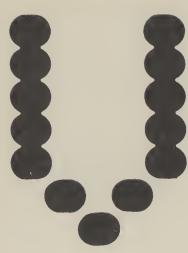
Screen Shot
PROGRAMMING SERIES

Screen Shot books available from larger branches of BOOTS, MENZIES, WH SMITH and other leading bookshops and computer stores. In case of difficulty, write to: Dorling Kindersley, 1-2 Henrietta Street, London WC2E 8PS.



Screen Shot Books 1 and 2 available for Commodore 64, Acorn Electron, BBC Micro, Sinclair ZX Spectrum, Sinclair ZX Spectrum+, Apple IIe. Books 3 and 4 available from April 1985.

Dorling Kindersley Publishers Limited.



ICTUALS

HOW TO USE EASY ENTER

EASY ENTER

How we reproduce listings

We have two methods of presenting listings. When we can, we run them through a converter program that replaces the hieroglyphic control codes with more meaningful symbols.

When you see . . .	It means . . .	And you . . .	(RED)	change to red	press the RED key (CTRL and 3)
(CU)	cursor up	press the 'cursor up' key (shifted)	(CYN)	change to cyan	press the CYN key (CTRL and 4)
(CD)	cursor down	press the 'cursor down' key	(PUR)	change to purple	press the PUR key (CTRL and 5)
(CL)	cursor left	press the 'cursor left' key (shifted)	(GRN)	change to green	press the GRN key (CTRL and 6)
(HOM)	cursor to the top lefthand corner	press the HOME key	(BLU)	change to blue	press the BLU key (CTRL and 7)
(CLS)	clear	press the CLR key (shifted)	(YEL)	change to yellow	press the YEL key (CTRL and 8)
(DEF)	insert	press the INSert key (shifted)	(REV)	reverse on	press the RVS ON key (CTRL and 9)
(BLK)	change to black	press the BLK key (CTRL) and 1)	(OFF)	reverse off	press the RVS OFF key (CTRL and 0)
(WHT)	change to white	press the WHT key (CTRL and 2)	(SPC)	space	press the space bar; repeat the specified number of times

These listings we generally run out on a letter-quality printer, though, and conventional graphics can't be handled on a daisywheel. So some listings are done on a Commodore printer, in which case you may see the standard control codes:

CLR
HOME
RVS ON
RVS OFF
CURSOR UP
CURSOR DOWN
CURSOR LEFT
CURSOR RIGHT
SET COLOUR TO
BLACK
WHITE
RED
CYAN
PURPLE
GREEN
BLUE
YELLOW
THE FUNCTION KEYS CAN BE INCORPORATED INTO PRINT STATEMENTS TOO, AS WITH THE OTHER NON-ALPHANUMERIC KEYS. THEY APPEAR AS SPECIAL SYMBOLS IN A LISTING
F1 ...
F2 ...
F3 ...
F4 ...
F5 ...
F6 ...
F7 ...
F8 ...
F9 ...
F10 ...
F11 ...
F12 ...
F13 ...
F14 ...
F15 ...
F16 ...
F17 ...
F18 ...
F19 ...
F20 ...
F21 ...
F22 ...
F23 ...
F24 ...
F25 ...
F26 ...
F27 ...
F28 ...
F29 ...
F30 ...
F31 ...
F32 ...
F33 ...
F34 ...
F35 ...
F36 ...
F37 ...
F38 ...
F39 ...
F40 ...
F41 ...
F42 ...
F43 ...
F44 ...
F45 ...
F46 ...
F47 ...
F48 ...
F49 ...
F50 ...
F51 ...
F52 ...
F53 ...
F54 ...
F55 ...
F56 ...
F57 ...
F58 ...
F59 ...
F60 ...
F61 ...
F62 ...
F63 ...
F64 ...
F65 ...
F66 ...
F67 ...
F68 ...
F69 ...
F70 ...
F71 ...
F72 ...
F73 ...
F74 ...
F75 ...
F76 ...
F77 ...
F78 ...
F79 ...
F80 ...
F81 ...
F82 ...
F83 ...
F84 ...
F85 ...
F86 ...
F87 ...
F88 ...
F89 ...
F90 ...
F91 ...
F92 ...
F93 ...
F94 ...
F95 ...
F96 ...
F97 ...
F98 ...
F99 ...
F100 ...
F101 ...
F102 ...
F103 ...
F104 ...
F105 ...
F106 ...
F107 ...
F108 ...
F109 ...
F110 ...
F111 ...
F112 ...
F113 ...
F114 ...
F115 ...
F116 ...
F117 ...
F118 ...
F119 ...
F120 ...
F121 ...
F122 ...
F123 ...
F124 ...
F125 ...
F126 ...
F127 ...
F128 ...
F129 ...
F130 ...
F131 ...
F132 ...
F133 ...
F134 ...
F135 ...
F136 ...
F137 ...
F138 ...
F139 ...
F140 ...
F141 ...
F142 ...
F143 ...
F144 ...
F145 ...
F146 ...
F147 ...
F148 ...
F149 ...
F150 ...
F151 ...
F152 ...
F153 ...
F154 ...
F155 ...
F156 ...
F157 ...
F158 ...
F159 ...
F160 ...
F161 ...
F162 ...
F163 ...
F164 ...
F165 ...
F166 ...
F167 ...
F168 ...
F169 ...
F170 ...
F171 ...
F172 ...
F173 ...
F174 ...
F175 ...
F176 ...
F177 ...
F178 ...
F179 ...
F180 ...
F181 ...
F182 ...
F183 ...
F184 ...
F185 ...
F186 ...
F187 ...
F188 ...
F189 ...
F190 ...
F191 ...
F192 ...
F193 ...
F194 ...
F195 ...
F196 ...
F197 ...
F198 ...
F199 ...
F200 ...
F201 ...
F202 ...
F203 ...
F204 ...
F205 ...
F206 ...
F207 ...
F208 ...
F209 ...
F210 ...
F211 ...
F212 ...
F213 ...
F214 ...
F215 ...
F216 ...
F217 ...
F218 ...
F219 ...
F220 ...
F221 ...
F222 ...
F223 ...
F224 ...
F225 ...
F226 ...
F227 ...
F228 ...
F229 ...
F230 ...
F231 ...
F232 ...
F233 ...
F234 ...
F235 ...
F236 ...
F237 ...
F238 ...
F239 ...
F240 ...
F241 ...
F242 ...
F243 ...
F244 ...
F245 ...
F246 ...
F247 ...
F248 ...
F249 ...
F250 ...
F251 ...
F252 ...
F253 ...
F254 ...
F255 ...
F256 ...
F257 ...
F258 ...
F259 ...
F260 ...
F261 ...
F262 ...
F263 ...
F264 ...
F265 ...
F266 ...
F267 ...
F268 ...
F269 ...
F270 ...
F271 ...
F272 ...
F273 ...
F274 ...
F275 ...
F276 ...
F277 ...
F278 ...
F279 ...
F280 ...
F281 ...
F282 ...
F283 ...
F284 ...
F285 ...
F286 ...
F287 ...
F288 ...
F289 ...
F290 ...
F291 ...
F292 ...
F293 ...
F294 ...
F295 ...
F296 ...
F297 ...
F298 ...
F299 ...
F300 ...
F301 ...
F302 ...
F303 ...
F304 ...
F305 ...
F306 ...
F307 ...
F308 ...
F309 ...
F310 ...
F311 ...
F312 ...
F313 ...
F314 ...
F315 ...
F316 ...
F317 ...
F318 ...
F319 ...
F320 ...
F321 ...
F322 ...
F323 ...
F324 ...
F325 ...
F326 ...
F327 ...
F328 ...
F329 ...
F330 ...
F331 ...
F332 ...
F333 ...
F334 ...
F335 ...
F336 ...
F337 ...
F338 ...
F339 ...
F340 ...
F341 ...
F342 ...
F343 ...
F344 ...
F345 ...
F346 ...
F347 ...
F348 ...
F349 ...
F350 ...
F351 ...
F352 ...
F353 ...
F354 ...
F355 ...
F356 ...
F357 ...
F358 ...
F359 ...
F360 ...
F361 ...
F362 ...
F363 ...
F364 ...
F365 ...
F366 ...
F367 ...
F368 ...
F369 ...
F370 ...
F371 ...
F372 ...
F373 ...
F374 ...
F375 ...
F376 ...
F377 ...
F378 ...
F379 ...
F380 ...
F381 ...
F382 ...
F383 ...
F384 ...
F385 ...
F386 ...
F387 ...
F388 ...
F389 ...
F390 ...
F391 ...
F392 ...
F393 ...
F394 ...
F395 ...
F396 ...
F397 ...
F398 ...
F399 ...
F400 ...
F401 ...
F402 ...
F403 ...
F404 ...
F405 ...
F406 ...
F407 ...
F408 ...
F409 ...
F410 ...
F411 ...
F412 ...
F413 ...
F414 ...
F415 ...
F416 ...
F417 ...
F418 ...
F419 ...
F420 ...
F421 ...
F422 ...
F423 ...
F424 ...
F425 ...
F426 ...
F427 ...
F428 ...
F429 ...
F430 ...
F431 ...
F432 ...
F433 ...
F434 ...
F435 ...
F436 ...
F437 ...
F438 ...
F439 ...
F440 ...
F441 ...
F442 ...
F443 ...
F444 ...
F445 ...
F446 ...
F447 ...
F448 ...
F449 ...
F450 ...
F451 ...
F452 ...
F453 ...
F454 ...
F455 ...
F456 ...
F457 ...
F458 ...
F459 ...
F460 ...
F461 ...
F462 ...
F463 ...
F464 ...
F465 ...
F466 ...
F467 ...
F468 ...
F469 ...
F470 ...
F471 ...
F472 ...
F473 ...
F474 ...
F475 ...
F476 ...
F477 ...
F478 ...
F479 ...
F480 ...
F481 ...
F482 ...
F483 ...
F484 ...
F485 ...
F486 ...
F487 ...
F488 ...
F489 ...
F490 ...
F491 ...
F492 ...
F493 ...
F494 ...
F495 ...
F496 ...
F497 ...
F498 ...
F499 ...
F500 ...
F501 ...
F502 ...
F503 ...
F504 ...
F505 ...
F506 ...
F507 ...
F508 ...
F509 ...
F510 ...
F511 ...
F512 ...
F513 ...
F514 ...
F515 ...
F516 ...
F517 ...
F518 ...
F519 ...
F520 ...
F521 ...
F522 ...
F523 ...
F524 ...
F525 ...
F526 ...
F527 ...
F528 ...
F529 ...
F530 ...
F531 ...
F532 ...
F533 ...
F534 ...
F535 ...
F536 ...
F537 ...
F538 ...
F539 ...
F540 ...
F541 ...
F542 ...
F543 ...
F544 ...
F545 ...
F546 ...
F547 ...
F548 ...
F549 ...
F550 ...
F551 ...
F552 ...
F553 ...
F554 ...
F555 ...
F556 ...
F557 ...
F558 ...
F559 ...
F560 ...
F561 ...
F562 ...
F563 ...
F564 ...
F565 ...
F566 ...
F567 ...
F568 ...
F569 ...
F570 ...
F571 ...
F572 ...
F573 ...
F574 ...
F575 ...
F576 ...
F577 ...
F578 ...
F579 ...
F580 ...
F581 ...
F582 ...
F583 ...
F584 ...
F585 ...
F586 ...
F587 ...
F588 ...
F589 ...
F590 ...
F591 ...
F592 ...
F593 ...
F594 ...
F595 ...
F596 ...
F597 ...
F598 ...
F599 ...
F600 ...
F601 ...
F602 ...
F603 ...
F604 ...
F605 ...
F606 ...
F607 ...
F608 ...
F609 ...
F610 ...
F611 ...
F612 ...
F613 ...
F614 ...
F615 ...
F616 ...
F617 ...
F618 ...
F619 ...
F620 ...
F621 ...
F622 ...
F623 ...
F624 ...
F625 ...
F626 ...
F627 ...
F628 ...
F629 ...
F630 ...
F631 ...
F632 ...
F633 ...
F634 ...
F635 ...
F636 ...
F637 ...
F638 ...
F639 ...
F640 ...
F641 ...
F642 ...
F643 ...
F644 ...
F645 ...
F646 ...
F647 ...
F648 ...
F649 ...
F650 ...
F651 ...
F652 ...
F653 ...
F654 ...
F655 ...
F656 ...
F657 ...
F658 ...
F659 ...
F660 ...
F661 ...
F662 ...
F663 ...
F664 ...
F665 ...
F666 ...
F667 ...
F668 ...
F669 ...
F670 ...
F671 ...
F672 ...
F673 ...
F674 ...
F675 ...
F676 ...
F677 ...
F678 ...
F679 ...
F680 ...
F681 ...
F682 ...
F683 ...
F684 ...
F685 ...
F686 ...
F687 ...
F688 ...
F689 ...
F690 ...
F691 ...
F692 ...
F693 ...
F694 ...
F695 ...
F696 ...
F697 ...
F698 ...
F699 ...
F700 ...
F701 ...
F702 ...
F703 ...
F704 ...
F705 ...
F706 ...
F707 ...
F708 ...
F709 ...
F710 ...
F711 ...
F712 ...
F713 ...
F714 ...
F715 ...
F716 ...
F717 ...
F718 ...
F719 ...
F720 ...
F721 ...
F722 ...
F723 ...
F724 ...
F725 ...
F726 ...
F727 ...
F728 ...
F729 ...
F730 ...
F731 ...
F732 ...
F733 ...
F734 ...
F735 ...
F736 ...
F737 ...
F738 ...
F739 ...
F740 ...
F741 ...
F742 ...
F743 ...
F744 ...
F745 ...
F746 ...
F747 ...
F748 ...
F749 ...
F750 ...
F751 ...
F752 ...
F753 ...
F754 ...
F755 ...
F756 ...
F757 ...
F758 ...
F759 ...
F760 ...
F761 ...
F762 ...
F763 ...
F764 ...
F765 ...
F766 ...
F767 ...
F768 ...
F769 ...
F770 ...
F771 ...
F772 ...
F773 ...
F774 ...
F775 ...
F776 ...
F777 ...
F778 ...
F779 ...
F780 ...
F781 ...
F782 ...
F783 ...
F784 ...
F785 ...
F786 ...
F787 ...
F788 ...
F789 ...
F790 ...
F791 ...
F792 ...
F793 ...
F794 ...
F795 ...
F796 ...
F797 ...
F798 ...
F799 ...
F800 ...
F801 ...
F802 ...
F803 ...
F804 ...
F805 ...
F806 ...
F807 ...
F808 ...
F809 ...
F810 ...
F811 ...
F812 ...
F813 ...
F814 ...
F815 ...
F816 ...
F817 ...
F818 ...
F819 ...
F820 ...
F821 ...
F822 ...
F823 ...
F824 ...
F825 ...
F826 ...
F827 ...
F828 ...
F829 ...
F830 ...
F831 ...
F832 ...
F833 ...
F834 ...
F835 ...
F836 ...
F837 ...
F838 ...
F839 ...
F840 ...
F841 ...
F842 ...
F843 ...
F844 ...
F845 ...
F846 ...
F847 ...
F848 ...
F849 ...
F850 ...
F851 ...
F852 ...
F853 ...
F854 ...
F855 ...
F856 ...
F857 ...
F858 ...
F859 ...
F860 ...
F861 ...
F862 ...
F863 ...
F864 ...
F865 ...
F866 ...
F867 ...
F868 ...
F869 ...
F870 ...
F871 ...
F872 ...
F873 ...
F874 ...
F875 ...
F876 ...
F877 ...
F878 ...
F879 ...
F880 ...
F881 ...
F882 ...
F883 ...
F884 ...
F885 ...
F886 ...
F887 ...
F888 ...
F889 ...
F890 ...
F891 ...
F892 ...
F893 ...
F894 ...
F895 ...
F896 ...
F897 ...
F898 ...
F899 ...
F900 ...
F901 ...
F902 ...
F903 ...
F904 ...
F905 ...
F906 ...
F907 ...
F908 ...
F909 ...
F910 ...
F911 ...
F912 ...
F913 ...
F914 ...
F915 ...
F916 ...
F917 ...
F918 ...
F919 ...
F920 ...
F921 ...
F922 ...
F923 ...
F924 ...
F925 ...
F926 ...
F927 ...
F928 ...
F929 ...
F930 ...
F931 ...
F932 ...
F933 ...
F934 ...
F935 ...
F936 ...
F937 ...
F938 ...
F939 ...
F940 ...
F941 ...
F942 ...
F943 ...
F944 ...
F945 ...
F946 ...
F947 ...
F948 ...
F949 ...
F950 ...
F951 ...
F952 ...
F953 ...
F954 ...
F955 ...
F956 ...
F957 ...
F958 ...
F959 ...
F960 ...
F961 ...
F962 ...
F963 ...
F964 ...
F965 ...
F966 ...
F967 ...
F968 ...
F969 ...
F970 ...
F971 ...
F972 ...
F973 ...
F974 ...
F975 ...
F976 ...
F977 ...
F978 ...
F979 ...
F980 ...
F981 ...
F982 ...
F983 ...
F984 ...
F985 ...
F986 ...
F987 ...
F988 ...
F989 ...
F990 ...
F991 ...
F992 ...
F993 ...
F994 ...
F995 ...
F996 ...
F997 ...
F998 ...
F999 ...
F9999 ...

When you see any of the codes prefixed by a number, you must press the appropriate key the same number of times. for example:

(3SPC) means — press the spacebar three times
or
(5CD) means — press 'cursor down' key five times

Q-Bert: when you see [G > \] you must press SHIFT together with 'L' sign

Destroyer: Line 9060 should read: $YC = 70 - 10 * \sin(N * \pi / 16)$

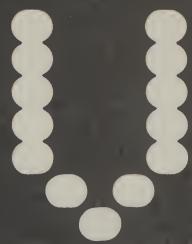
Stuntman: the " " sign means you press the spacebar

Everest: this program was listed using an 'easy enter' system

different to our own. If you've not worked it out already, copies

of the Key can be obtained by writing to us here at Commodore

User.



FACTUALS

MICRO MIND – FOR THE COMMODORE 16

Versions of Mastermind can be found for virtually all micros. So why should the C-16 be left out? The object of the game is to work out what the secret colour combination is by placing coloured markers in a row. 'S' and 'A' are used to select colours by moving an arrow to the correct colour. The spacebar then places it. And so on until you've used up your ten chances. The computer will then display the correct combination.

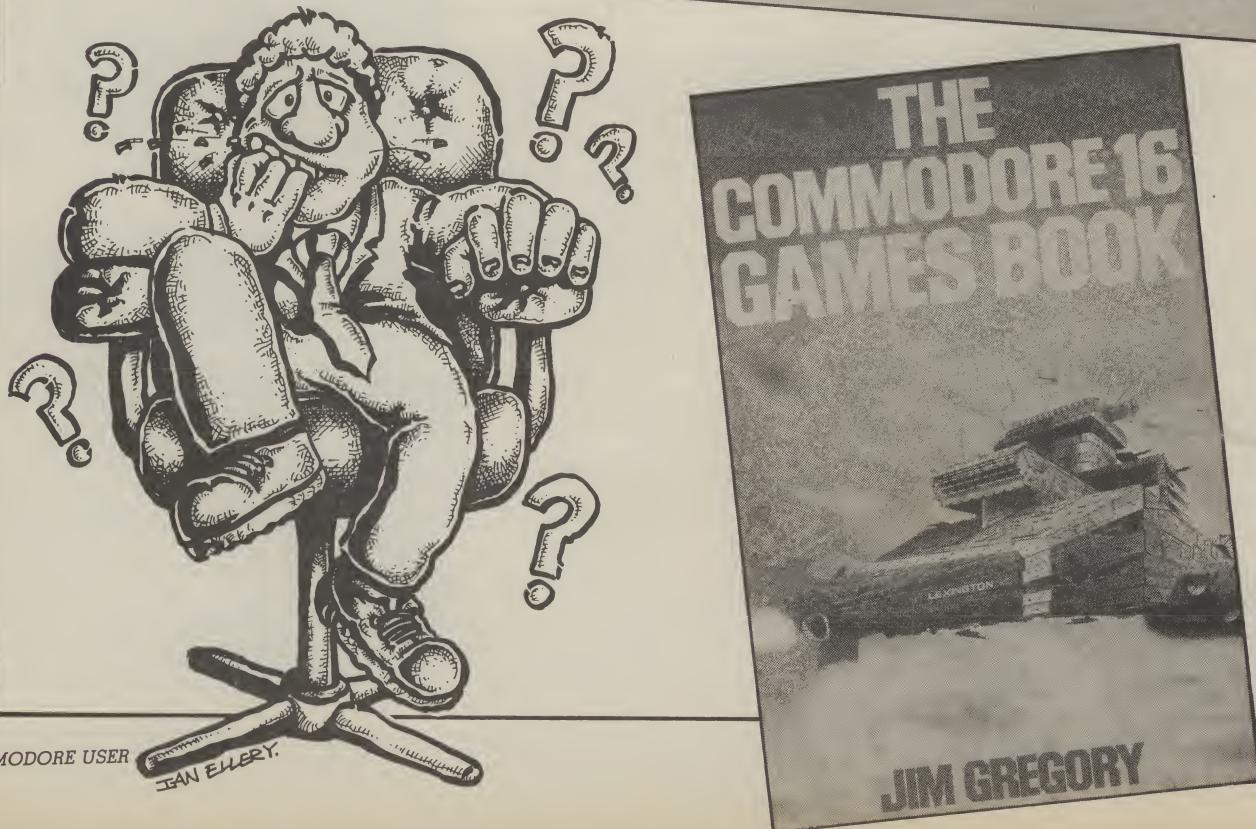
The C-16 tells you how accurate you were by giving: 'heart' — for right colour, right place 'cross' — for wrong colour, wrong place 'asterisk' — for right colour, wrong place.

This program was taken from *The Commodore 16 Games Book* by Jim Gregory, by arrangement with Collins the publishers. The book costs £6.95 and we're offering copies to the first five readers who write in for one. Address your letter to: C-16 Book Offer, Commodore User, 30-32 Farringdon Lane, London EC1R 3AU.

```

10 REM >>>>>MICRO MIND<<<<<
20 REM >>>>GREG/ANDY/JIM<<<<<
30 FORT=1TO6:READP(T),S(T):NEXT:VOL8:COLOR
0,1:COLOR4,1:GRAPHIC1
40 SCNCLR:GOSUB170:G=25:H=24:Z$=" " :FORA=
1TO4:X=(A*4)-2:B$=" {^Q}{^W}" .
50 CHAR1,X,2,Z$,1:NEXT:FORY=4TO22STEP2:FOR
X=2TO16STEP4:CHAR1,X,Y,B$:NEXTX,Y
60 L=1:GOSUB90
70 GOSUB100:GOSUB190:IFA$=" YYYY " THEN300
80 L=L+1:IFL=11THEN290:ELSEGOTO70
90 FOR0=1TO4:N=INT(RND(1)*6)+1:N(0)=N:NEXT
:RETURN
100 FORC=1TO6:COLOR1,P(C),S(C):X=C+24:CHAR
1,X,4," ",1:NEXT:Q=2
110 COLOR1,2,7:CHAR1,G,5," ^":FORT=1TO20:NE
XT:CHAR1,G,5," "
120 GOSUB350:IFE=1ANDG>25THEN=G-1
130 IFR=1ANDG<30THEN=G+1:ELSEIFF=1THEN150
140 GOTO110
150 U=G-24:COLOR1,P(U),S(U):CHAR1,Q,L*2+2,
" {^Q}":Q=Q+4:U(Q/4)=U
160 IFQ=18THENRETURN:ELSEGOTO110
170 RESTORE380:COLOR1,2,7:CHAR1,4,0," MICRO
MIND"
180 DRAW1,200,189:FORT=1TO43:READX,Y:DRAWT
0X,Y:NEXT:RETURN
190 A$=" " :Q=3:COLOR1,9,5:FORZ=1TO4
200 IFU(Z)=N(Z)THENCHAR1,Q,L*2+2," {^S}":A$=
=A$+" Y":GOTO220

```



```

210 CHAR1,Q,L*2+2,"{^V}":A$=A$+"X"
220 Q=Q+4:NEXT:Q=3:S=0:FORZ=1TO4
230 IFMID$(A$,Z,1)="Y"THEN SOUND1,100,10:GO
T0270
240 FORW=1TO4
250 IFU(Z)=N(W)ANDMID$(A$,W,1)="X"THENCHAR
1,Q,L*2+2,"*":GOSUB280
260 NEXT:IFS=0THEN SOUND1,450,10
270 Q=Q+4:SOUND1,0,5:NEXT:RETURN
280 SOUND1,300,10:S=1:RETURN
290 M$="SORRY":GOTO310
300 M$="DID IT IN "+STR$(L)+" TRY'S"
310 FORA=1TO4:M=N(A):COLOR1,P(M),S(M):X=(A
#4)-2:CHAR1,X,2,Z$,1:NEXT
320 CHAR1,23,6,M$
330 CHAR1,24,15,"TRY AGAIN"
340 GOSUB350:IFF=0THEN340:ELSE GOTO40
350 E=0:R=0:F=0:K=PEEK(198):IFK=10THEN E=1
360 IFK=13THEN R=1:ELSE IFK=60THEN F=1
370 RETURN:DATA3,2,5,4,6,3,8,7,4,5,7,3
380 DATA206,177,202,173,192,172,189,168,18
9,166,193,159,189,156,187,152,190
390 DATA150,188,148,186,146,188,143,190,14
1,191,138,191,135,189,133,179,133
400 DATA176,130,176,128,178,126,188,114,19
0,106,192,97,200,87,212,79,230,75
410 DATA238,74,250,77,262,81,271,90,276,98
,278,108,278,114,276,122,275,132
420 DATA272,142,270,150,267,160,264,164,26
0,168,254,174,255,177,270,189

```

by Jim Gregory

COLOURS

{BLK}= BLACK=(CTRL+1)
 {WHT}= WHITE=(CTRL+2)
 {BLK}= RED=(CTRL+3)
 {CYN}= CYAN=(CTRL+4)
 {PUR}=PURPLE=(CTRL+5)
 {GRN}= GREEN=(CTRL+6)
 {BLU}= BLUE=(CTRL+7)
 {YEL}=YELLOW=(CTRL+8)
 {OR}=ORANGE=(CBM+1)
 {BRN}=BROWN=(CBM+2)
 {RVS ON}=RVS ON=(CTRL+9)
 {RVS OFF}=RVS OFF=(CTRL+0)
 {CUR L}=CURSOR LEFT
 {CUR RT}=CURSOR RIGHT
 {CUR UP}=CURSOR UP
 {CUR DN}=CURSOR DOWN
 {HOME}=HOME CURSOR
 {CLR}=CLEAR SCREEN
 0=FLASH ON =CTRL+COMMA
 -=FLASH OFF=CTRL+FULL STOP

CHARACTER CODES

{*X}=CBM KEY + KEY INDICATED
 {^X}=SHIFT KEY + KEY SHOWN

1985—THE YEAR OF COMMUNICATIONS

Everybody's doing it—linking their home computers to giant mainframes and networking to thousands of micro users via the phone and a modem.

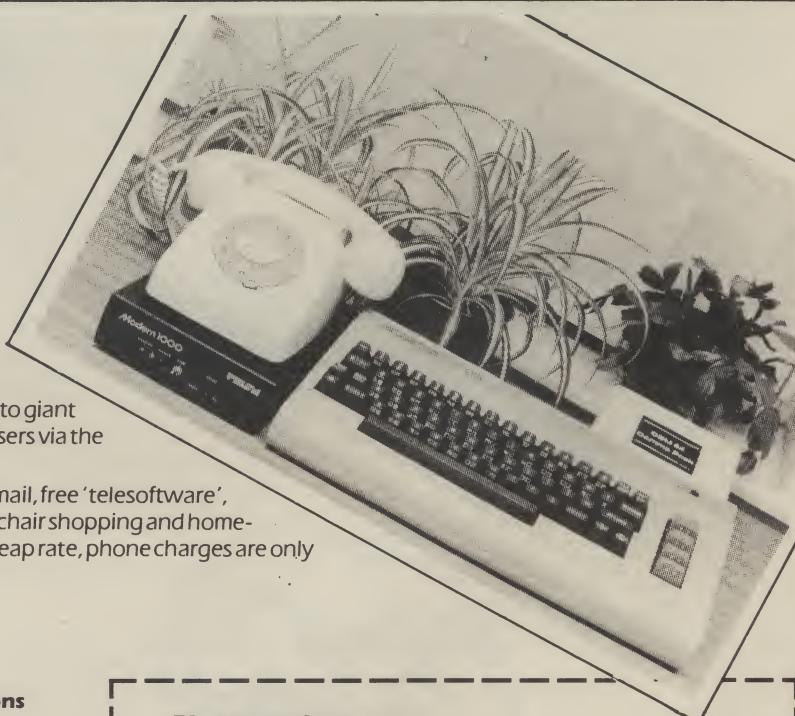
A whole new world of mainframe games, electronic mail, free 'telesoftware', electronic notice boards, real time conversation, armchair shopping and home-banking will be at your fingertips! And at local and cheap rate, phone charges are only around 40p for a whole hours' entertainment.

Commodore 64:Modem 1000 plus communications cartridge reduced from £129.95 to only £89.95 inclusive of VAT & p.+p.

* All Modems provide 1200/75 baud, enabling access (with a subscription) to Prestel, BT Gold, Micronet and some free bulletin boards.

Simply clip the coupon and send it with a cheque (payable to Telemap Ltd) to:

**EMAP Modem Offer, 3rd Floor,
8 Herbal Hill, London EC1R 5JB.**



Please send to me:

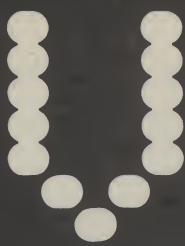
Commodore 64 Modem(s)

I enclose £_____

Name _____

Address _____

Telephone _____



FACTUALS

SOLITAIRE — FOR THE COMMODORE 16

Here's a good computer version of the ever-popular Solitaire game. Remember how you play? There are 33 holes and 32 pegs. You have to remove pegs by jumping over a peg into an adjacent hole, ending up with just one peg in the middle.

Just position the cursor over the peg to be moved using the cursor control keys. Press the spacebar to confirm the choice.

Then position the cursor over the vacant hole and press the spacebar to execute the move. Press 'q' to quit at any time.

This version has at least two advantages over the original: bleeps tell you whether you've made a good or illegal move and, since the pegs are on-screen, you can't lose them . . .

**EASY
JEN'TER**

```

30 REM * SOLITAIRE BY M. THOMSON *
60 C$=CHR$(147):H$=CHR$(19):D$=CHR$(17):R$=CHR$(29):U$=CHR$(145):L$=CHR$(157)
70 RV$=CHR$(18):R0$=CHR$(146):UC$=CHR$(142):LC$=CHR$(14):BL$=CHR$(31)
80 CR$=CHR$(13):Y$=CHR$(113):N$=CHR$(119):FORN=1TO22:P$=P$+D$:NEXT
90 DEFFNU(X)=X-80:DEFFND(X)=X+80:DEFFNL(X)=X-2:DEFFNR(X)=X+2
100 PRINTC$BL$LC$::POKE53281,15:POKE53280,15
110 FORN=1TO7:PRINTD$R$R$::NEXT:PRINT"[G>S]PACE TO PLAY"D$D$-----"D$D$"
120 PRINTSPC(9)"[G>P]RESS [G>S]PACE TO PLAY"D$D$"
130 GETK$:IFK$<>"THEN150
150 PRINTC$UC$;
550 PRINTC$UC$;
560 PRINTCHR$(117)::FORN=1TO37:PRINTCHR$(99)::NEXT:PRINTCHR$(105);";";
570 FORN=1TO19:PRINTCHR$(98);SPC(37);CHR$(98);";";NEXT:PRINTCHR$(107);";
580 PRINTCHR$(106)::FORN=1TO37:PRINTCHR$(99)::NEXT:PRINTCHR$(107);";
590 PRINTH*D$D$;
600 FORN=1TO2:PRINTCR$;SPC(17)::FORP=1TO3:PRINTY$;CHR$(32)::NEXT:NEXT
610 FORN=1TO3:PRINTCR$;SPC(13)::FORP=1TO7:PRINTY$;CHR$(32)::NEXT:NEXT
620 FORN=1TO2:PRINTCR$;SPC(17)::FORP=1TO3:PRINTY$;CHR$(32)::NEXT:NEXT
630 NS=1443:OS=NS:C=32:POKENS,87
640 GOSUB10000
650 FLAG=0
660 POKE204,0
670 GETK$:IFK$<>D$ANDK$<>R$ANDK$<>U$ANDK$<>L$ANDK$<>"ANDK$<>"Q"THEN670
680 IFK$="THENPOKE204,1:POKENS,PEEK(NS)AND127:GOT0760
690 IFK$="Q"THENPOKE204,1:POKENS,PEEK(NS)AND127:GOT0900
700 IFK$=D$THENOS=NS:NS=FND(NS)
710 IFK$=R$THENOS=NS:NS=FNR(NS)
720 IFK$=U$THENOS=NS:NS=NU(NS)

```



by M Thomson

```
730 IFK$=L$THENOS=NS:NS=FNL (NS)
740 IFPEEK (NS)=32THENNS=OS:GOT0670
750 POKE204, 1:PRINTK$K$; :POKEOS, PEEK (OS) AND127:GOT0660
760 IFFLAGTHEN800
770 IFPEEK (NS) <>81THENGOSUB10002:GOT0650
780 F=22:GOSUB12000:GOSUB10001
790 FLAG=1:PEG=NS:GOT0660
800 IFPEEK (NS) <>87THENGOSUB10002:GOT0650
810 D=NS-PEG
820 IFABS (D) <>4ANDABS (D) <>1600RPEEK (PEG+D/2) <>81THENGOSUB10002:GOT0650
830 POKEPEG, 87:POKEPEG+D/2, 87:POKENS, 81:C=C-1
840 IFC=1ANDPEEK (1443)=81THENPRINTC$D$D$D$D$"WELL DONE!":GOT0910
850 F=22:GOSUB12000
860 GOT0640
900 PRINTC$D$D$D$D$"HARD LUCK!.....ONLY" C"LEFT!""
910 PRINTD$D$D$"ANOTHER GAME ? "CR$"
920 GETK$
930 IFK$="Y"THENRUN
940 IFK$<>"N"THEN920
950 END
10000 M$="MOVE WHICH PEG ? ...":GOT011000
10001 M$="MOVE TO WHERE ? ...":GOT011000
10002 M$="ERROR ! ....."
10010 F=8:GOSUB12000:GOSUB11000:FORD=0T0500:NEXT:GOT010000
11000 POKE204, 1:PRINTH$P$M$;
11010 PRINTH$; :PP=NS-1024:Y=INT (PP/40):X=PP-Y*40
11020 FORP=1TOX:PRINTR$; :NEXT:FORP=1TOY:PRINTD$; :NEXT:RETURN
12000 S=54272:FORN=0T023:POKES+N, 0:NEXT
12010 POKES+24, 15:POKES, 143:POKES+1, F:POKES+5, 9:POKES+6, 249:POKES+4, 17
12020 POKES+4, 16:POKES+5, 0:RETURN
```

UNLEASH THE POWER WITHIN YOUR '64

EXTENDED BASIC

With Built-in M/C
ASSEMBLER



£19.50



£21.50

51 EXTRA COMMANDS

10 EXTRA CTRL CODES

60 page REF. MANUAL

2 or 3 Pass ASSEMBLER

RENUMBER (inc. GOTOS & GOSUBS)
PROCEDURE & other structure commands
PERIPHERAL, MUSIC, GRAPHIC, SPRITE, HI-RES
DRAWING, 'F' KEY DEFINITION, and many more.

AND YET THIS 16K M/C PROG. IS 'HIDDEN', USING
JUST 2.5K OF BASIC MEMORY — LEAVING YOU—

36.5K of USEABLE BASIC MEM.

This Month's
PRINTER OFFER . . .
EPSON
RX 80F/T
(R.R.P. £327 inc VAT)

YOU PAY THE EX. VAT RRP £285
& WE'LL PAY THE VAT (£42.75)
DELIVERY (£10), CABLE & S/W,
(£19.50), & a free copy of
SUPER SCRAMBLE.

* Review in last weeks HCW.

ADVANCED CENTRONICS INTERFACE



S/W ONLY

£9.50 + £2



S/W + CABLE

£19.50 + £2

PROGRAM LISTINGS SHOW:-

ALL CBM 64 CONTROL CODES.

THE CBM 64 GRAPHICS SET.

USER DEFINED CHARACTERS.

SPACES (UPPER or LOWER).

COMPATIBILITY

Prog. will Auto Re-LOCATE at top of memory, or can be
LOADED into a MEMORY LOCATION as SPECIFIED BY
USER! VERY 'USER FRIENDLY.' YOU CAN 'MIX' HI &
LOW RES SCREEN DUMPS, EVEN DIRECT OFF DISC?

WANTED!
C · 16 SOFTWARE
PHONE US NOW!
PROGRAMMERS

We need ALL kinds of S/W for most micros.
S/W must be HIGH QUALITY, useful, user-friendly and, preferably, innovative. If you
fit the bill — please contact us.

HYPERDRIVE THE ULTIMATE DISK UTILITY

By Dave
Partington

£9.50

FEATURES A TURBOCHARGER

(Make your disk-based S/W load 4 times faster!)

+ 28 EXTRA FACILITIES . . .

MAKE ERRORS 20-21-22-23-29 : CHECK ERRORS :

MAKE ALPHA NUMERIC DIRECTORY : RENAME DISK

— (inc. both IDs) : MAKE DIRECTORY NON LIST/NON

LOAD : UN-SCRATCH : REVEAL SCRATCH — (NAMES

EVERY FILE THAT HAS EVER BEEN SCRATCHED) 1

BYTE READ/WRITE : MAKE NON-REVERSABLE WRITE

PROTPLUS MANY MORE USEFUL FEATURES.

SUPER SCRAMBLE

One of our 'CLASSIC'
Arcade Games



£6.50

HERE'S WHAT THE REVIEWERS HAVE TO SAY SO FAR:
Simply, it is even better than the original arcade game... it
is an example of state of the arts game.

YOUR COMMODORE

Currently my favourite variant of the game.

COMMODORE

The design is excellent with smooth scrolling and nicely
animated radar scanners . . . If you need a Scramble to
complete your collection, this one is worth a look.

HOME COMPUTER WEEKLY

ALL PRICES INCLUDE VAT,
POST & PACKING.
OVERSEAS PLEASE ADD £1:
TRADE ENQS WELCOME

MUSHROOM SOFTWARE
193 ROMMANY ROAD
LONDON SE27 9PR



FACTUALS

GRAF-VICS — FOR THE VIC-20 (UNEXPANDED)

```
10 PRINT "[CLS][8CD][6CR]GRAF-VICS":PRINT "[5CR]*-----*"
20 PRINT "[3CD][2CR]BY M.D.MACDONALD."
30 POKE36879,187:SC=30720:SS=7703
40 POKE51,255:POKE52,27:POKE55,255:POKE56,27
50 FORI=0TO511:POKE7168+I,PEEK(32768+I):NEXTI
60 FORT=0TO39:READA:POKE7632+T,A:NEXTT
70 FORT=0TO7:READA:POKE7432+T,A:NEXTT
80 POKE36869,255
90 FORI=0TO31:POKE7448+I,0:NEXTI
100 FORI=32TO39:POKE7448+I,255:NEXTI
110 PRINT "[CLS]"
120 FORT=1TO16:POKE7680+T,61
130 POKE8054+T,58:POKE7680+T*22,59
140 POKE7697+T*22,60:NEXTT
150 POKE7689,33:POKE7878,62:POKE7873,33:POKE8062,62
160 FORXX=0TO15
170 FORYY=0TO15:POKESS+XX+YY*22,32
180 POKESS+XX+YY*22+SC,0:NEXTYY:NEXTXX
190 IFRR=1THEN710
200 POKE7743,35:POKE7765,36:POKE7744,37:POKE7766,38
210 POKE38463,0:POKE38485,0:POKE38464,0:POKE38486,0
220 PRINT "[HOM][18CD]""
230 PRINT"U,D,L,R,I,O,C,B,P,N,X,E"
240 GETA$
250 IFA$="C"THENF=32:G=0:GOTO480
260 IFA$="B"THENF=39:G=255:GOTO480
270 IFA$="I"THENF=39:GOTO530
280 IFA$="O"THENF=32:GOTO530
290 IFA$="P"THEN600
300 IFA$="E"THEN810
310 IFA$="N"THEN820
320 IFA$="L"THENX=X-1:GOTO430
330 IFA$="R"THENX=X+1:GOTO440
340 IFA$="U"THENY=Y-1:GOTO450
350 IFA$="D"THENY=Y+1:GOTO460
360 IFA$="X"THEN930
370 LL=SS+X+Y*22:OL=PEEK(LL)
380 POKELL,42:POKELL+SC,2
390 FORT=1TO100:NEXTT
400 POKELL,OL:POKELL+SC,0
410 FORT=1TO100:NEXTT
420 GOTO240
430 IFX<0THENX=0:GOTO240
440 IFX>15THENX=15:GOTO240
450 IFY<0THENY=0:GOTO240
460 IFY>15THENY=15
470 GOTO240
480 FORXX=0TO15
490 FORYY=0TO15
500 POKESS+XX+YY*22,F:NEXTYY:NEXTXX
510 FORI=0TO31:POKE7448+I,G:NEXTI
520 GOTO240
530 POKESS+X+Y*22,F
540 X1=7:Y1=0:IFX>7THENX1=15:Y1=16
550 CC=0
560 FORZZ=0TO7
570 IFPEEK(SS+Y*22+X1-ZZ)=39THENCC=CC+2^ZZ
580 NEXTZZ
590 POKE7448+Y1+Y,CC:GOTO240
600 PRINT "[CLS]"
```

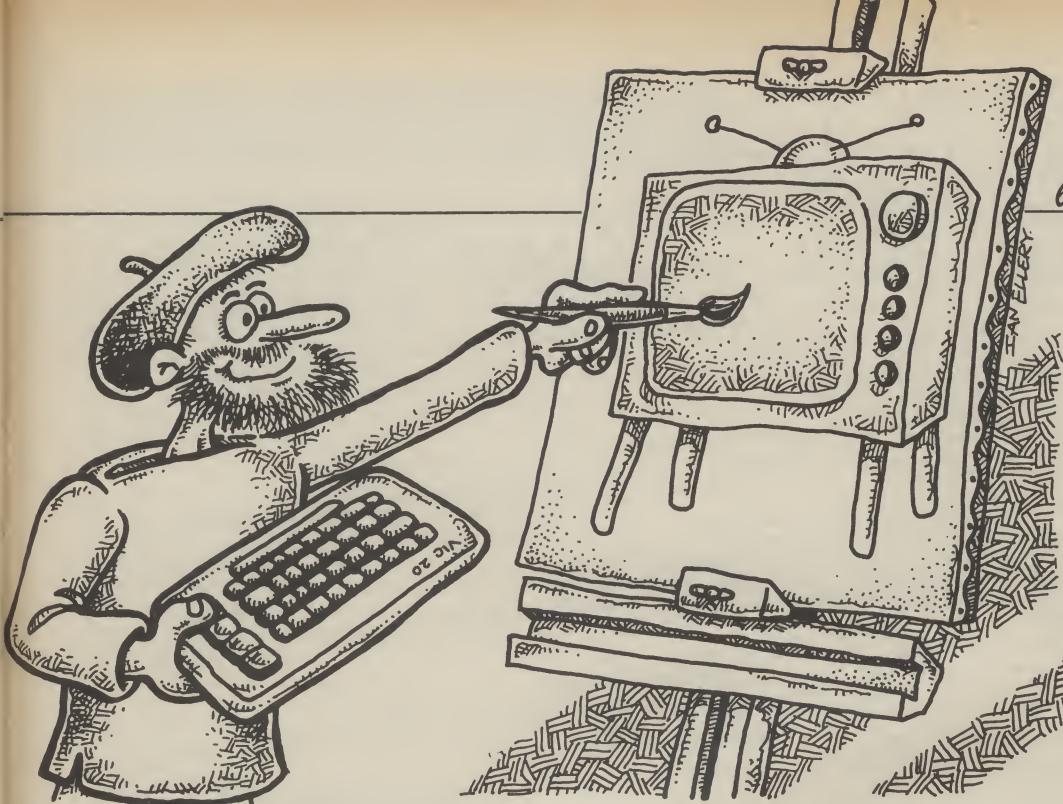
This program is intended to be used as an aid to creating user defined graphics. By using the commands detailed in Fig 1 you can build up an 8 times full size copy of your required character, while at the same time a normal size version is being displayed at the right-hand side of the screen. The building up of the character takes place in a 16 x 16 work area which allows 4 characters to be constructed in a 2 x 2 block to allow larger units to be built up.

The screen can be cleared to either spaces by 'C' command or reverse spaces by 'B', i.e. completely black, and then individual blocks can be removed or inserted by 'I' or 'O' commands. If at any time you wish to reverse the character this can also be accomplished by entering 'X'.

At all times the possible option keys are displayed at the bottom of the screen.

When you are satisfied with the character, pressing 'P' will cause the four sets of eight values which represent the character(s) in the character generator to be printed. From this point the available options are listed in Fig 2.

If you already have a set of values and wish to observe or alter the character which they produce, then pressing 'N' allows you to enter them and the character will be displayed on the screen. For this purpose the four character positions are



by M D MacDonald

numbered as in Fig 3 and the sets of values should be entered in that order. If you do not wish to enter values for any of the four characters then entering a 'Z' instead of the first value will zero-fill that character. A few sets of values are given to demonstrate this option and can be altered by the other facilities of the program.

```

610 FORA=0TO15
620 B=PEEK(7448+A):C=PEEK(7464+A)
630 PRINTB,C:IFA=7THENPRINT
640 NEXTA
650 PRINT"[2CD]JR,C,E"
660 GETA$:IFA$=""THEN660
670 IFA$="E"THEN810
680 IFA$="C"THEN90
690 IFA$="R"THENRR=1:GOTO110
700 GOTO660
710 FORXX=0TO1
720 FORYY=0TO15
730 CC=PEEK(7448+XX*16+YY)
740 CT=256
750 FORZZ=7TO0STEP-1
760 LC=7710-ZZ+XX*8+YY*22
770 CT=CT/2:IFCC=>CTTHENCC=CC-CT:POKELC,39:POKELC+SC,0
780 NEXTZZ:NEXTYY:NEXTXX
790 RR=0
800 GOTO200
810 PRINT"[CLS][2CD]BYE":END
820 YY=0
830 PRINT"[CLS]ENTER VALUES FOR", "CHARACTER":YY+1;"[2CD]"
840 XX=0
850 PRINT"LINE":XX+1::INPUTA$:IFXX=0ANDA$="Z"THEN910
860 A=VAL(A$):IFA>255THENPRINT"WRONG-ENTER AGAIN:GOTO850
870 POKE7448+XX+YY*8,A
880 XX=XX+1:IFXX<8THEN850
890 YY=YY+1:IFYY<4THEN830
900 RR=1:GOTO110
910 FORXX=0TO7:POKE7448+XX+YY*8,0:NEXTXX
920 GOTO890
930 FORXX=0TO15
940 FORYY=0TO15:LC=SS+XX+YY*22:ZZ=0
950 IFPEEK(LC)=32THENPOKELC,39:ZZ=1
960 IFPEEK(LC)=39ANDZZ=0THENPOKELC,32
970 NEXTYY:NEXTXX
980 FORLC=7448T07479:POKELC,255-PEEK(LC):NEXTLC
990 GOTO240
1000 DATA 255,0,0,0,0,0,0,1,1,1,1,1,1,1,1,1
1010 DATA 128,128,128,128,128,128,128,128,0,0,0,0,0,0,0,255
1030 DATA 255,1,1,1,1,1,1,1,128,128,128,128,128,128,128,128,255

```

U	Cursor Up.
D	Cursor Down.
L	Cursor Left.
R	Cursor Right.
I	Fill in Cursor Location.
O	Clear Cursor Location.
C	Clear Work Screen.
B	Set Work Screen To Reverse Blanks.
P	Print Values of Created Characters.
N	Allow entry of Numeric Data.
X	Reverse Print Characters.
E	End Program.

Fig 1. First screen options.

R	Return to First Screen With Present Characters.
C	Return to First Screen With Screen Cleared.
E	End Program.

Fig 2. Second screen options.

1	3
2	4

Fig 3. Positions for each of the four characters.

EXAMPLE 1. PHOENIX

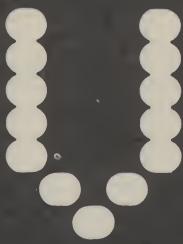
Char1	1,243,120, 60, 31, 15, 7, 1
Char2	3, 3, 3, 5, 5, 10, 0, 0
Char3	128,143,158,188,248,240,224,192
Char4	224,224,224,208,208,168, 0, 0

EXAMPLE 2. RACEHORSES

Char1	4, 9, 27,222, 62, 34, 85,136
Char2	0, 0, 0, 3, 0, 0, 1, 2
Char3	0, 0,128, 0, 0, 0, 0, 0,128
Char4	16, 36,110,120,248,136, 84, 34

EXAMPLE 3. RACING CAR

Char1	219,219,255,231,231,60, 60
Char2	60, 24, 24,219,255,255,219, 60
Char3	Z
Char4	Z



ICTUALS

2-D SPIRAL — COMMODORE 64

by Neil Phillips

We didn't know quite what to make of this program. It's one of those mind-bogglers that don't seem to have any practical use! However, we feel sure that our inventive readership will think of something. And if you can't it's sure to amuse you.

What does it do? Whenever you press a

```

1 REM NEIL PHILLIPS
2 REM 10/20/83
3 REM 2-D SPIRALS
5 PRINT "[CLS]"
6 PRINT "[HOMJ]"; : GETA$: IF A$ = "" THEN 6
8 IF A$ = CHR$(141) THEN PRINT "[CLS][2CD][3CR][RED]BYE! [3CD][BLU]": CLR: END
10 PRINTTAB(10) "[11CD]"; A$; A$; "[2CL][CD]"; A$;
11 FORX=1TO9
20 FORM=1TO2*X: PRINTA$; : NEXT
30 FORN=1TO2*X: PRINT "[CL][CU]"; A$; : NEXT
40 FORV=1TO2*X+1: PRINT "[2CL]"; A$; : NEXT
49 IF X=9 THEN FORT=1TO2*X: PRINT "[CL][CD]"; A$; : NEXT: GOTO 6
50 FORT=1TO2*X+1: PRINT "[CL][CD]"; A$; : NEXT
60 NEXT
98 REM TYPE IN A

```

SHIFTED <RETURN> TO END.

key, it prints that character in a spiral

pattern on the screen . . .

DATA STATEMENT GENERATOR AND VERIFIER — VIC-20 by C Walls

It is often necessary to include large quantities of data in Basic programs by using DATA statements. One of the most common examples being machine code programs presented in magazines.

The five-line program in Figure 1 provides a solution to this problem. It prompts for the DATA statement line number and then accepts up to 100 data items. Just Return causes it to PRINT the DATA statement,

Return it and RUN itself again. To terminate the sequence, respond with a negative line number or RUN-STOP/RESTORE.

Here's how the program runs:
Line 0 — sets up storage for the data items
Line 1 — accepts DATA statement line number (overwriting the READY message)
Line 2 — accepts each data item

FIGURE 1

```

0 DIMDA$(99)
1 INPUT "[CD]DATA STATEMENT"; DS: IF DS<0 THEN END
2 FORCN=0 TO 99: INPUTDA$(CN): IF DA$(CN)<>"" THEN NEXT
3 PRINTDS; "DATA"; : FORI=0 TO (CN-2): PRINTDA$(I); ",": NEXT: PRINTDA$(CN-1): PRINT "RUN"
4 POKE631, 145: POKE632, 145: POKE633, 145: POKE634, 145:
POKE635, 13: POKE636, 13: POKE198, 6

```

Line 3 — PRINTs resulting DATA statement and RUN command
Line 4 — loads keyboard buffer with 4 CURSOR-UPS and 2 RETURNS (RETURNing the DATA statement and RUN command to Basic).

The program may easily be renumbered, since it contains no internal line references and being only 5

FIGURE 2

```

0 READK$: PRINTK$#
1 GETK$: IF K$ = "" THEN 1
2 GOTO 0

```

lines, is easily deleted.

The three-line program in Figure 2 gives a meaning of verifying the resulting DATA statements, displaying one for each key entry. When the end is reached it crashes with "OUT OF DATA".

DELETE COMMODORE 64

by Fred Reid

Have you ever had to delete part of a large program the hard way by typing in the line numbers and pressing Return? This machine code program could save you lots of trouble.

If the part you want to keep will fit on to the screen, all you have to do is LIST it, type NEW, and then type Return over the lines you want. However, if you can't fit everything on to the screen, you will lose whatever isn't displayed when you type NEW.

Delete works in the same way as NEW, modifying the

line pointers in memory so that the computer doesn't know those lines are there, but you can delete a range of lines, leaving all lines outside that range.

For example: to delete lines 100 to 350, type **SYS49243, 100-350**, but the range parameters follow the same format as for the LIST command, for example **100-** will delete from line 100 to the end of the program, while **-100** will delete every line up to 100. Warning! Be careful how you use Delete, could delete the wrong lines.

```

1 REM** DELETE **
2 REM
3 REM** BY FRED REID **
4 REM
5 REM** (C) 1984 **
6 REM
7 REM** USE "SYS49243,L1-L2" **
8 REM
9 REM
50 FORI=0 TO 165: READA: POKEI+49243, A: NEXT
100 DATA32, 191, 192, 165, 95, 166, 96
110 DATA133, 251, 134, 252, 32, 19, 166
120 DATA165, 95, 166, 96, 144, 10, 160
130 DATA1, 177, 95, 240, 4, 170, 136
140 DATA177, 95, 133, 122, 134, 123, 165
150 DATA251, 56, 229, 122, 170, 165, 252
160 DATA229, 123, 168, 176, 30, 138, 24
170 DATA101, 45, 133, 45, 152, 101, 46
180 DATA133, 46, 160, 0, 177, 122, 145
190 DATA251, 200, 208, 249, 230, 123, 230
200 DATA252, 165, 46, 197, 252, 176, 239
210 DATA32, 51, 165, 165, 34, 166, 35
220 DATA24, 105, 2, 133, 45, 144, 1
230 DATA232, 134, 46, 32, 89, 166, 76
240 DATA116, 164, 32, 253, 174, 32, 121
250 DATA0, 144, 22, 240, 14, 201, 171
260 DATA208, 10, 169, 1, 133, 95, 169
270 DATA8, 133, 96, 208, 21, 76, 8
280 DATA175, 234, 234, 234, 32, 107, 169
290 DATA32, 19, 166, 32, 121, 0, 240
300 DATA12, 201, 171, 208, 235, 32, 115
310 DATA0, 32, 107, 169, 208, 227, 165
320 DATA20, 5, 21, 208, 6, 169, 255
330 DATA133, 20, 133, 21, 96

```

Sophisticated Games for Vic 20/CBM 64

Vic/64 Cricket	Realistic game of tactical skill and luck. Ball by ball commentary with full scorecard and all the major rules of cricket correctly interpreted. Printer/game save facilities.
Vic Cricket for Vic 20 + 16K.....	£6.99
New: 64 Cricket with extra features	£7.99
League Soccer	League title game for 2-24 players with automatic fixtures, action commentary, results check, scorers, league table, cup draw etc. Printer/game save facilities.
League Soccer for Vic 20 + 16K.....	£6.99
New: 64 League Soccer with many more features still	£7.99
Whodunnit	12 guests have gathered for drinks at Murder Manor, but one of them has more than drinks on his mind. Addictive and thrilling detective game for 1 to 6 players, with genuinely different game each time.
Whodunnit for Vic 20 + 8K or any CBM 64 (state which)	£5.99
Top of the Pops	Easy to learn game about the music business. For up to 10 players. Includes printer/game save features.
Top of the Pops for Vic 20 + 8K	£5.99
New: 64 Top of the Pops — even bigger and better.....	£6.99
Election Night Special	Lead your own Party into the next General Election. A game for 1-3 players. Printer/game save.
Election Night Special for Vic 20 + 8K or any CBM 64	£5.99
Party 4	Four games to match the progress of your party: Masterword, A Day at the Races, Game X (Strip Poker) and Consequences. Harmless fun (nothing offensive) but good fun.
Vic Party 4 for Vic + 3K or more	£6.99
64 Party 4.....	£6.99
NEW: Adults Only	Fun game for 2-10 broadminded players. Lots of cuddling and kissing, plus many other rewards and forfeits: you never know what you'll end up doing, or with whom! Nothing offensive, but you MUST be fairly broadminded.
Adults Only for Vic 20 + 16K expansion	£6.99
64 Adults Only	£6.99

Disc versions available for all games — £2.00 extra.

All prices include P&P (UK only). Games sold subject to conditions of sale which are available on request.

Please write or phone for details of our full range.

Sophisticated Games "Dept 333"

27 Queens Road, Keynsham, Avon BS18 2NQ

Tel: 02756 3427

SHEKHANA COMPUTER SERVICES DISCOUNT COMMODORE SOFTWARE

** COMMODORE 64 **	RRP	OUR PRICE	** COMMODORE 64 **	RRP	OUR PRICE
GHOSTBUSTERS	10.95	8.20	SHOOT THE RAPIDS	7.95	5.95
SUICIDE EXPRESS	7.95	5.95	SPY VS SPY	9.95	7.50
OTHER ACTIVISION	9.95	7.50	BREAK FEVER	7.00	5.20
ZIM SALA BIM	9.95	7.50	SPIDERMAN	9.95	7.50
STRIP POKER	9.95	7.50	CAD CAM WARRIOR	9.95	7.50
EMPIRE OF KARN	7.00	5.20	HUNCHBACK II	7.90	5.90
TALES OF ARABIAN NIGHTS	7.00	5.20	MATCHPOINT	7.95	5.95
BEACHEAD	9.95	7.50	SHERLOCK	14.95	11.20
BRUCE LEE	9.95	7.50	SELECT 1	12.49	9.95
HAVOC	9.95	7.50	F15 STRIKE EAGLE	14.95	11.20
INDIANA JONES	9.95	7.50	JET SET WILLY	7.95	5.95
QUASIMODOS REVENGE	7.90	5.90	TALES OF ARABIAN NIGHTS	7.00	5.20
KOKOTINI WILF	6.95	5.20	INTERNAT. FOOTBALL (ROM)	14.95	11.20
ZAXXON	9.95	7.50	VALHALLA	14.95	9.99
SUMMER GAMES	14.95	11.20	ALL LEVEL 9	9.99	7.50
STELLAR 7	9.95	7.50	** COMMODORE 16 **	7.95	4.99
RAID OVER MOSCOW	9.95	7.50	CRAZY GOLF	5.99	4.45
STAFF OF KARNATH	9.95	7.50	FIRE ANT	5.99	4.45
EUREKA	14.95	11.20	MAYHEM	5.99	4.45
CLIFFHANGER	7.95	5.95	STELLAR WARS/BLITZ	5.99	4.45
DALEY THOMP			GAMES PACK 2	5.99	4.45
DECATHLON	7.95	5.95			
SCRABBLE	12.95	9.70			
FIGHTER PILOT	9.95	7.50			

All prices include postage, packing and VAT. Overseas orders welcome. Please order stating 1) Program required, 2) Amount enclosed, 3) Name and address, 4) Type of computer.

Please make cheques and postal orders payable to:

Shekhana Computer Services
653 Green Lanes, London N8 0QY
Tel: 01-800 3156
Please send SAE for list.

THE 64 SOFTWARE CENTRE

1 PRINCETON STREET, LONDON WC1R 4RL.
Telephone: 01-430 0954

The specialist centre with the largest stock of software for the Commodore 64 (domestic and imported).

BUSINESS • HOUSEHOLD • EDUCATION • UTILITIES • GAMES

Open 10 a.m. to 6 p.m. (including Saturdays). Demonstration facilities — support given with business programs. Mail order. (Access, Visa, Eurocard, Mastercard).

Very good people to deal with.

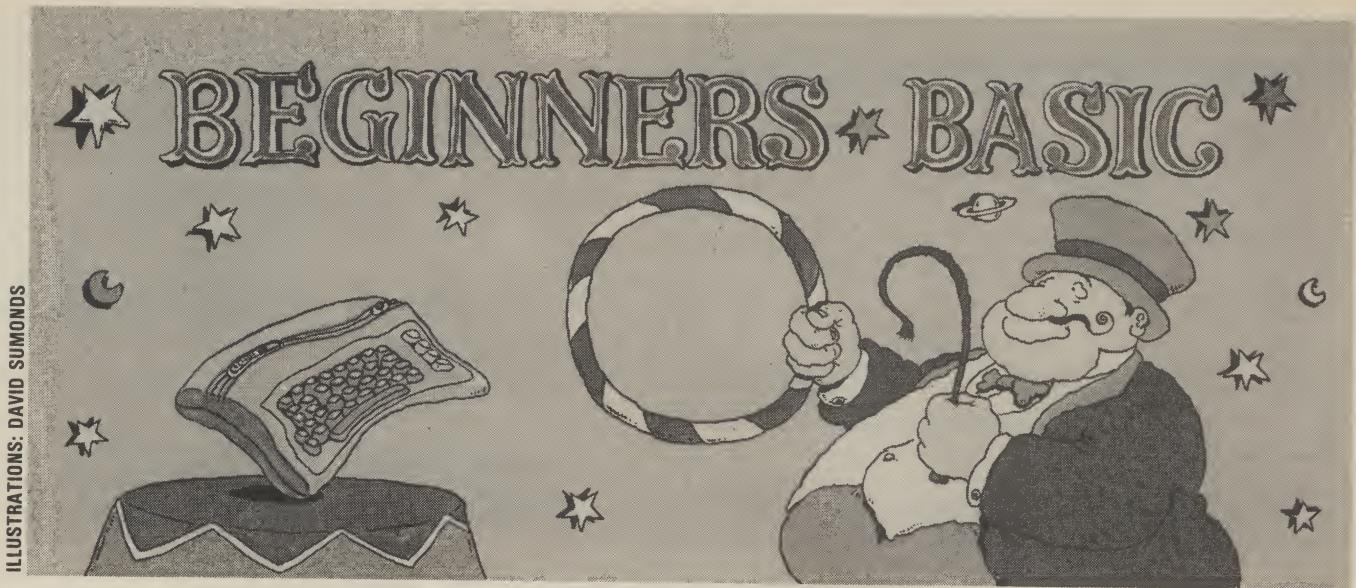
ZOOMSOFT

Commodore Software Specialists

Title	cass	disk	Title	cass	disk
BOULDER DASH.....	8.95	10.95	SPITFIRE ACE.....	9.95	12.95
BRISTLES.....	8.95	10.95	BEACH HEAD.....	9.95	12.95
ASRO CHASE.....	8.95	10.95	DALLAS QUEST.....	N/A	14.95
FLIP FLOP.....	8.95	10.95	BRUCE LEE.....	14.95	14.95
FORT APOCALYPSE.....	9.95	14.95	KNIGHTS OF THE DESERT.....	14.95	14.95
AZTEC CHALLENGE.....	8.95	12.95	COMBAT LEADER.....	14.95	14.95
ZORK I.....	N/A	11.95	TIGERS IN THE SNOW.....	14.95	14.95
ZORK II.....	N/A	11.95	BATTLE OF NORMANDY.....	14.95	14.95
ZORK III.....	N/A	11.95	BLUE MAX.....	9.95	14.95
STARCROSS.....	N/A	11.95	MULTIPLAN.....	N/A	99.95
DEADLINE.....	N/A	11.95	PAINTBRUSH.....	ROM	19.95
ENCOUNTER.....	9.95	12.95	PERSONAL ACCOUNTANT.....	25.60	N/A
FLIGHT SIMULATOR (Sublogic).....	34.25	37.95	GRAPHICS BASIC.....	N/A	25.55
S.A.M.....	N/A	41.95	HOUSEHOLD FINANCE.....	22.85	N/A
FORBIDDEN FOREST.....	8.95	12.95	LOGO.....	N/A	56.25
JETBOOT JACK.....	7.95	N/A	POLE POSITION.....	ROM	14.95
NATO COMMANDER.....	9.95	12.95	HARD HAT MACK.....	9.95	12.95
SUPER BASE 64.....	N/A	86.25	DAVID'S MIDNIGHT MAGIC.....	9.95	12.95
ADVENTURE CREATOR.....	ROM	29.95	PITSTOP.....	8.95	11.95
Beyond Castle			DRAGON RAIDERS OF PERN.....	8.95	11.95
WOLFENSTEIN.....	N/A	27.95	IMPOSSIBLE MISSION.....	8.95	11.95
CASTLE WOLFENSTEIN.....	N/A	21.95	SPLUNKER.....	9.95	12.95
MASTER TYPE.....	N/A	32.75	ONE ON ONE.....	9.95	12.95
MASTER TYPE.....	ROM	32.75	M.U.L.E.....	11.95	14.95
SPRITE MAKER.....	9.95	N/A	JUMP MAN.....	8.95	11.95
LETTER WIZARD.....	N/A	34.95	CHOP LIFTER.....	9.95	12.95
MASK OF THE SUN.....	N/A	28.75	RAID ON BUNGELING BAY.....	9.95	12.95
OROL.....	N/A	25.75	FLYER FOX (Takie).....	9.95	14.95
SPELL WIZARD.....	N/A	34.95	REALM OF IMPOSSIBILITY.....	9.95	12.95
B.C.'S QUEST FOR TYRES.....	9.95	N/A	ARCHON.....	11.95	14.95
MR ROBOT.....	8.95	11.95			

100's more titles available. Send S.A.E. for free catalogue. Send cheques, P.O. to:

Zoomsoft,
46 Huntsworth Mews, London NW1 6DB.
Telephone: 01-723 0562.



ILLUSTRATIONS: DAVID SUMMONDS

Part 2 – variables, loops and arrays

By Brian Grainger

Now that you've all recovered from last month's gentle introduction, it's time to delve a little further into the mysteries of Basic. What are those mysterious things called variables, loops and arrays that the boffins talk so much about? Read on and find out.

Hello again. How did you get on with the exercise I set last month? The aim was to write a program which would ask for the user's name and print a smiling face and welcoming message. Obviously, there is more than one way of doing this and here is the way I chose to do it. Perhaps you experimented and used different graphic characters to make up the face or used a dash of colour to make it more interesting. If not, why not play around with my solution. Now to more serious stuff.

Variables

You will notice in my program that I have used the 'box', **NAS\$**, again. Last time I said that **NAS\$** is used as a label for the 'box' and in my program the 'box' would hold the name of the user. The technical name for this box is a **VARIABLE**. That is because the value of the variable (or contents of the 'box' if you like) can be changed.

When you say:

PRINT "BRIAN";

the program will always print **BRIAN**. "**BRIAN**" is a

CONSTANT value. But when you say:

PRINT NAS\$

the program will print whatever the value of **NAS\$** is at the time you ask to print it.

Types of Variables

In all the examples so far we have only used variables which hold strings of characters. These are not surprisingly called **string variables**. You may be asking yourself how can you do *arithmetic* in a program. The answer is that there are other types of variables that instead of holding strings of characters can hold numbers.

The first type of variable that holds numbers is one that includes only whole numbers (without any decimal places) such as 1, 5, 7, -126. Here is an example of how we would set such a variable to the value 10:

1% = 10

We call 1% an **integer variable** because it can only hold whole numbers. If you try to set it to a decimal number it will replace it with the nearest whole number *less* than or *equal* to the decimal number you have given. So **1% = 2.7** will set 1% to 2 and **1% = -2.7** will set 1% to -3.

We will certainly want to hold decimal numbers in our programs so there is a third type of variable which the

technically minded call a **floating point variable**. In the line below such a variable will be set to the value of 1.37: **FP = 1.7**

So now we know that the 'boxes' we call variables can hold different types of values such as string variables, integer variables and floating point variables. Phew.

Naming your Variables

Just as we have rules for identifying houses to help the postman, we have rules for naming variables to help Commodore Basic. Floating point variable names can be any set of alphabetic or numeric characters but the first one must be an alphabetic character. Examples of valid names are: **DATE**, **DAY**, **I**, **B52**. Example of names which are not allowed are: **52B**, **DATE:DAY**.

However many characters are in the name, Basic will ignore any following the first two. So Basic regards **DATE** and **DAY** as the same variable because the first two characters of each are identical. For this reason variable names in Basic programs are usually not longer than two characters.

Integer variable names have exactly the same rules, but the name *must* be followed by '%' sign. **1%**, **B6%** are valid names for integer

Q = CLEAR	J = CBM KEY + X
Q = CURSOR DOWN	I = CBM KEY + N
Q = CURSOR RIGHT	- = SHIFT + C
R = CBM KEY + A	I = SHIFT + B
T = CBM KEY + S	C = SHIFT + J
L = CBM KEY + Z	J = SHIFT + K

```

5 INPUT"WHAT IS YOUR NAME":NAS$  

? PRINT"HELLO ";NAS$  

10 PRINT"  

20 PRINT"  

30 PRINT"  

40 PRINT"  

50 PRINT"  

60 PRINT"  

70 PRINT"  

80 PRINT"  

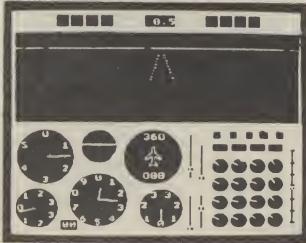
90 PRINT"  

95 PRINT  

100 PRINT"HELLO ";NAS$  


```

747 Flight Simulator
(over 15,000 sold already)



Picture shows BBC/B version (2 colour)

Look at these features on our CBM-64 version.

- * full colour high-resolution graphics
- * fast - 100% machine code
- * real engine sound and audible alarms
- * take-off, land and fly between seven airports
- * instrument landing system (ILS)
- * precise, perspective view through cockpit window
- * joystick optional
- * full, four-engine instrumentation
- * 21 real dials plus many other indicators

Available direct from DACC Ltd.

Cassette £9.95

Disk £11.95

★★ Commodore 64 Accessories ★★

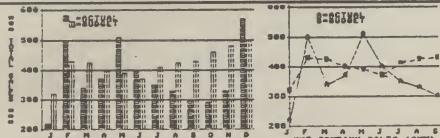
★★ High quality PVC dust cover	each: £2.95
★★ Blank C20 cassettes	five for: £2.75
★★ Disks s/s s/d	each: £1.95
★★ Disk storage box	each: £1.95
★★ Flow-chart template	each: £1.00

All prices include VAT, P&P

Despatch within 48 hours by first class post

★★ Special Offer — order 747 F/S and receive dust-cover or any other accessory absolutely free ★★

order from DACC Ltd. (Dept CU5 2)
23 Waverley Road, Hindley, Wigan, Lancs. WN2 3BN.



VIGIL stands for VIDEO INTERACTIVE GAME INTERPRETIVE LANGUAGE. VIGIL is a simple new language for writing game and graphics programs for your VIC-20. VIGIL brings you more than 60 powerful commands for manipulating graphics figures. Even if you do not wish to learn another language, VIGIL has a lot to offer. The package comes complete with 9 games on tape or disk. Listings of the games and full instructions for using VIGIL are given in the 70+ page manual. VIGIL runs on a VIC-20 with any memory expander. Also available for PET (40 column)

Price: £7.50 on tape; £8.95 on disk.

Plan and track your personal budget for the year with BUDGETER.

Features include:

- * more than 40 specified categories for expenses and income.
- * Automatic calculation of payments for up to 9 credit cards.
- * Automatic yearly totals of each category.
- * Data storage on tape or disk.
- * Hardcopy of worksheet to printer.
- * Bar graph of monthly accounts and averages.

BUDGETER runs on the Commodore-64, C16 and Plus 4, VIC-20 (expanded) and PET.

Price: £8.95 on tape; £10.95 on disk.

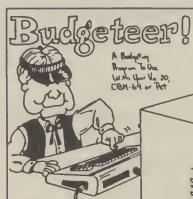
Play against the computer with this classic card game. Versions available for CBM-64, Vic-20 (16K), Plus 4 and PET. C16 version soon — please enquire.

Price: £5.50 on tape; £7.50 on disk.

Are you having difficulty in finding software for your VIC-20? We still carry a good range of games and utility software for your machine and most prices have been reduced.

Commodore-16/Plus 4 owners — send for our growing list of games and utility programs.

ADAMSOFT
(Dept. CU), 18 Norwich Avenue, Rochdale,
Lancs OL11 5JZ.
Tel: 0706 524304 (preferably after 6 p.m.)



NEW

- Commodore 64 -

TURBO - BREAKER

AT LAST, Transfer Turbo games to Disk Blank screen, Flashing and picture screen turbos by most software houses Easy to use.....£10.95

******* TURBO - SAVER *******

Make easy Turbo back up copies of your slow load games, no user knowledge needed, easy to use.....£8.00

******* TRANSFER - MK2 *******

Transfer most slow load games to Disk Simple to use, and needs no user knowledge, or skill.....£8.00

******* DISK - TURBO *******

Make your disk games load faster, 45secs instead of 2mins, does no harm to your drive.....£8.00

******* DISKOPY *******

A Selective disk copier, fast and very easy to use.....£7.00

******* DISK - DOCTOR *******

A Disk editor, alter any part of the disk, recover a scratched file£8.00

ARROW MICRO SERVICES

**20 Portmeadow Walk
London SE2**

PD100

WARP*5

GET A LOAD OF THIS!!!

£9.95

inc. p/p

WARP*5 will speed loading from your 1541 by over 5 TIMES FASTER.

Example: A 154 BLOCK program which normally loads in 1:40 will load with WARP*5 in 18 SECONDS!!

WARP*5 also includes enhanced DOS commands for easier use.

Also includes a bonus program — BOOT MAKER
Convert your machine-code programs to AUTO-RUN-WARP-LOAD from disk.

TOOLKIT MK.2

NOW THIS BEST SELLING
COLLECTION OF 1541 DISK
UTILITIES IS EVEN BETTER!!

INCLUDES:-

- * FAST DISK COPIER * EVEN FASTER DISK COPIER
- * LOADING ADDRESS RELOCATOR * AUTO RUN MAKER
- * DOS CHANGER * FILE LOCK/UNLOCK * DISK DOCTOR
- * DISK DRIVE MONITOR * DISK LOG * FILE RECOVERY
- * COMPACTOR * FILE COPIER * DISK ERROR LOCATOR
- * DISK ERROR MAKER — MAKES READ ERRORS 20, 21, 22, 23, 27 & 29 WHICH ALLOWS YOU TO BACKUP ALL YOUR VALUABLE PROTECTED DISK SOFTWARE.

ONLY £17.95 inc. p/p

Upgrade available for original TOOLKIT owners.
Phone or write for details.

Overseas orders please add £1.00

Send cheque or P.O. to:

MPS SOFTWARE
36 ALEXANDRA GROVE, LONDON N4 2LF
01-800-3592



'NA\$ is used as a label for the box and . . . the box would hold the name of the user'

More useful Loops

Let's look at one type of loop which we can control, the REPEAT - UNTIL loop. Suppose we wish to measure the numbers of seconds between a given start point and when a key is pressed and then display the result. The steps in our program might be:

- 1) Print a starting message and note the time it was printed.
- 2) REPEAT checking to see if a key is pressed UNTIL a key is pressed.
- 3) When the key is pressed note the time.
- 4) Print the time difference in seconds.

Let's use the special variable TI to measure the time. The following program is the Basic equivalent of the steps above. Remember to type NEW before entering the program into your computer.

200 PRINT" (CLS) PLEASE PRESS A KEY WHEN YOU THINK TEN (3SPC) SECONDS HAVE PASSED"

210 T=TI
220 GET A\$
230 IF A\$=" " THEN 220
240 S=TI
250 PRINT" (CD) YOU PRESSED THE KEY AFTER"; (S-T)/60;" SECONDS"

Complicated? Not really, we've just used a few new features. Line 200 prints the starting message and line 210 takes a note of the time by storing the start value of the special variable TI in a new variable, T. The '=' sign in this line means put the value of the expression on the right into the variable given by the name on the left.

In Line 220 we see a new command, GET. This checks to see if a key is pressed and stores the character value in the string variable A\$. If no key is pressed then a value of nothing, denoted by " " is stored in A\$.

Line 230 is the line which implements the REPEAT . . . UNTIL step. It uses two new commands IF and THEN. This works by looking at the expression after the IF command, in this case A\$=" ". If the expression is true the program will do whatever follows the THEN command, in this case jump to line 220. If the expression is false then the program carries on from the next line and the statement after the THEN command is ignored. A\$ will be equal to " " while a key isn't pressed so the program will repeat the

variables.

Finally, string variable names follow the same rules but the name *must* be followed by a '\$' sign like the example **NA\$** in our program.

If you try to give a numeric variable a character string value you will cause an error. A string variable cannot be given a numeric value either. So, **N\$ = 123** is incorrect, although **N\$ = "123"** is alright because "123" is a string of characters rather than a number.

Introducing the Array

Now it's time to introduce a rather special type of variable called an **Array**. If everybody gave their house an individual name the job of the postman would be very difficult. To make life easier we group houses into streets which have names and then each individual house in the street has a different number.

It is sometimes very convenient to do the same with variables. The equivalent of a street of variables is an **Array** and we name it just as before including a '%' or '\$' as necessary. To refer to each individual variable of an array we give it a number *in brackets* following the array name. For example **A(1)**, **A(2)**, **A(3)** are three individual variables, each of which can hold a different value, in the array called **A**. **A(N)** would also be a variable of the array if **N** had been set a number value beforehand.

The following little program:

10 A(1) = 5

20 N = 1
30 PRINT A(N)

will print the value of **A(1)** which has been set to 5.

Array dimensions

If you want to refer to more than 10 variables in the array then you must tell Basic to reserve space for the number of variables you want to use. We do this with a **DIM** command which gives Basic the 'dimension' or length of the array. We can only dimension an array once within a program so we must be sure to give the highest value we will need. In the example above if we wanted to set and print **A(50)** but nothing higher than the 50th variable of the array we would add an extra 1 line (5) so making the complete program:

5 DIM A(50)
10 A(50) = 46
20 N=50
30 PRINT A(N)

Try the above without line 5 first and see what happens.

Ready-made Variables

Basic itself automatically sets up two variables which you can use in your programs. The first of these is the string variable **TI\$** which gives the number of hours, minutes and seconds at any given time.

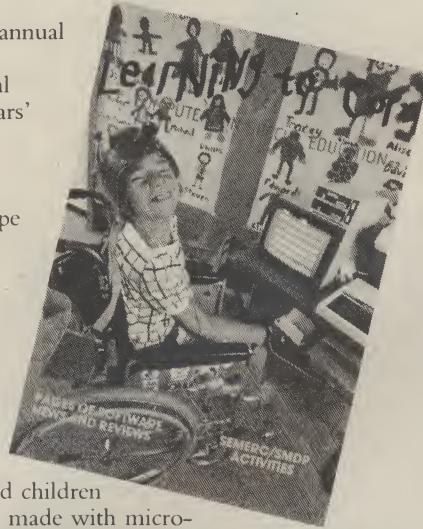
For example, if **PRINT TI\$** results in **013558** being printed it means that the clock inside your computer is reading 1 hour, 35 minutes and 58 seconds.

When the machine is turned on or reset, the clock will have to press the STOP key to stop the program.

Learning to Cope

Learning To Cope is an annual publication compiled by journalists on Educational Computing with five years' experience in the field of education and high technology. The third issue of Learning To Cope deals with all aspects of computers in special education.

This issue gives information on the latest developments in hardware and special aids designed and adapted for physically and mentally handicapped children and adults. The progress made with micro-electronic devices helps create independence for all who use them.



A large proportion of Learning To Cope is dedicated to software, with a catalogue listing all the specially designed programs for children and adults with specific needs. It also includes a comprehensive software reviews section which examines how programs can be used as teaching and learning aids across a wide range of subjects.

Computer applications are illustrated through case studies covering such topics as computers and the blind and how computers can help to stimulate mentally handicapped children.

Learning To Cope is the only publication which deals in depth with computers in special education. It offers practical advice and guidance as well as pages of useful information and contacts. It is something you cannot afford to miss if you are at all connected with the teaching of children and adults with special educational needs.

Please send me a copy of Learning To Cope — Computers in Special Education.

I enclose a cheque/postal order made payable to Educational Computing for £2 (including P & P). Discounts are available on bulk orders — contact the editorial office on 01-251 6222 ext. 2475.

Name _____

Position _____

Establishment _____

Address _____

Signed _____

Now please post to: Learning To Cope, Priory Court, 30-32 Farringdon Lane, London EC1R 3AU.

GET AN EYEFUL OF THIS!

INSIDE THE MARCH EDITION ...
Terminal Emulation
'Type-It-Yourself' Assembler
Secret Locations
Peripheral Invasion

95p EVERY MONTH

95p EVERY MONTH

SINCLAIR'S SUPERMICRO

**QL
USER**

QL USER — THE ONLY MAGAZINE FOR QL OWNERS AND ENTHUSIASTS.

Wick Price

loop until a key IS pressed, when **A\$=" "** is false.

Line 240 makes a note of the new time and line 250 prints a message which indicates the time passed in seconds. There are 60 jiffies in a second so we divide the time difference by 60.

FOR . . . NEXT and STEP

Another type of loop is needed when we want to carry out a number of statements over and over again where a variable takes on a different value each time the statements are repeated. If the values are in sequence and the difference between one value and the next is always



*'the simplest
form of loop is
one that goes
round and
74 round forever'*

the same we can use a **FOR . . . NEXT** loop. Let's suppose we want to display our tables, such as the 3 times table or the 12 times table.

Here are the steps you need to take in the program:

- 1) Ask the user which table he wishes to see and store that number, in **N** say.
- 2) **FOR** each value of **I** from 1 to 12 with a **STEP** of 1 between each to calculate the value of **I** multiplied by **N**, and print a line of the **N** times table.
- 3) Print a heading for the table.

We can translate the above steps into the following program:

```
10 PRINT" (CLS) WHICH  
TABLE DO YOU WANT."  
20 INPUT" GIVE A NUMBER  
BETWEEN 2 AND 12"; N  
30 PRINT : PRINT : PRINT  
40 FOR I=1 TO 12 STEP 1  
50 R=I*N  
60 PRINT I; "TIMES"; N;  
"=";R  
70 NEXT I  
80 PRINT  
90 PRINT "THE"; N; "TIMES  
TABLE"
```

Let me highlight the new ideas. Line 30 is slightly different. We have three statements on one line. In this case each statement is the same, **PRINT** a blank line, but they could be different. We can put as many statements on a line as we wish provided the total line length is no more than 80 characters. Each statement must be separated by a **:**.

Line 40 introduces the start of the loop by saying set **I** to a start value of 1, step the value by 1 each time and repeat the instructions between this statement and the **NEXT** statement until **I** is greater than 12. The effect will be to repeat lines 50, 60 with values of **I** of 1, 2, 3, . . . 12. When the step value is 1, as in this case, we need not add the **STEP 1** command. The Basic will assume a step value of 1 unless another value is given. The only other point to note is that in line 50 a ****** is used. This is the Basic character for the multiply sign (**X**).

Random numbers (RND)

As well as special variables, Basic has some built in functions that you can use in your programs. One such function is to generate a random decimal number between 0 and 1. A random number is one that is equally likely to be any of the values in the range 0-1 (but NOT 1

```
100 PRINT "(CLS) THIS GAME WILL TEST YOUR  
SPEED OF"  
110 PRINT "REACTION. YOU WILL BE GIVEN A TIME  
IN"  
120 PRINT "THE RANGE OF 5 TO 15 SECONDS. YOUR  
TASK"  
130 PRINT "IS TO PRESS A KEY WHEN YOU THINK  
THAT"  
140 PRINT "AMOUNT OF TIME HAS PASSED SINCE  
MESSAGE"  
150 PRINT "WAS GIVEN TO YOU. THIS TEST WILL  
BE"  
160 PRINT "REPEATED 5 TIMES. A SUMMARY OF  
RESULTS"  
170 PRINT "WILL BE DISPLAYED AT THE END."  
180 PRINT  
190 PRINT "PRESS A KEY WHEN YOU ARE READY TO  
START"  
200 GET A$  
210 IF A$=" " THEN 200  
220 DIM T(5), G(5)  
230 FOR NG=1 TO 5  
240 T(NG)=5+INT(RND(1)*(15-5+1))  
250 PRINT "(CLS) HIT A KEY IN";T(NG);";SECONDS"  
260 S=TI  
270 GET A$  
280 IF A$=" " THEN 270  
290 E=TI  
300 G(NG)=(E-S)/60  
310 PRINT "(CD) GET READY FOR NEXT GO"  
320 FOR I=1 TO 2000 : NEXT I  
330 NEXT NG  
340 PRINT "(CLS) HERE IS A RESULTS SUMMARY"  
350 PRINT  
360 PRINT "GAME", "TIME", "REACTION TIME"  
370 FOR I=1 TO 5  
380 PRINT I,T(I),G(I)  
390 NEXT I  
400 PRINT  
410 PRINT "THANK YOU FOR PLAYING"
```

itself). This can be used like dice.

To generate a random number and store it in the variable '**I**' we would say: **I=RND(1)**. The number 1 in brackets can be changed but the reason for doing so is beyond the scope of this series so well stick with 1 for the present. To generate a random whole number in a given range we would have to use an expression using the **RND** function. The following gives a whole number in the range 5 to 15. **I=5+INT(RND(1)*(15-5+1))**

We have used another Basic function, **INT**, in the above. This takes a decimal number and turns it into the nearest whole number less than or equal to the decimal number. You've guessed, it stands for 'integer'. Now for a little fun.

Play Time

Now let's put all the ideas introduced this time all together. Above is a simple game to test your reactions. You have five goes to try and guess a time interval that the

computer will randomly choose. At the end the computer will print a summary of the results. See if you can understand how the program works and note in particular the use of array variable to make the program shorter.

The exercise for you to look at this time is to write a program to simulate the flipping of a coin and show that the number of heads will roughly equal the number of tails if the number of flips is large enough. As a guide here are some steps to follow:

- 1) Ask the user how many times to flip.
- 2) Set up an array where the first element holds the number of heads and the second the number of tails.
- 3) For each flip carry out the following steps:

3.1 — Choose a random integer between 1 and 2 (head or tail).

3.2 — Add 1 to the appropriate array element.

- 4) Print the results.

Don't work too hard — see you next month when I'll take you further down the road of Basic programming.

Cronies and Frogs in Mikro-Gen's Progs....

NOW AVAILABLE ON COMMODORE 64 – £7.95

WITCH'S CAULDRON

SPECTRUM 48K £6.95



MIKRO-GEN

44 The Broadway, Bracknell, Berks. 0344 427317

COMMODORE C16 AND PLUS 4

LAS VEGAS



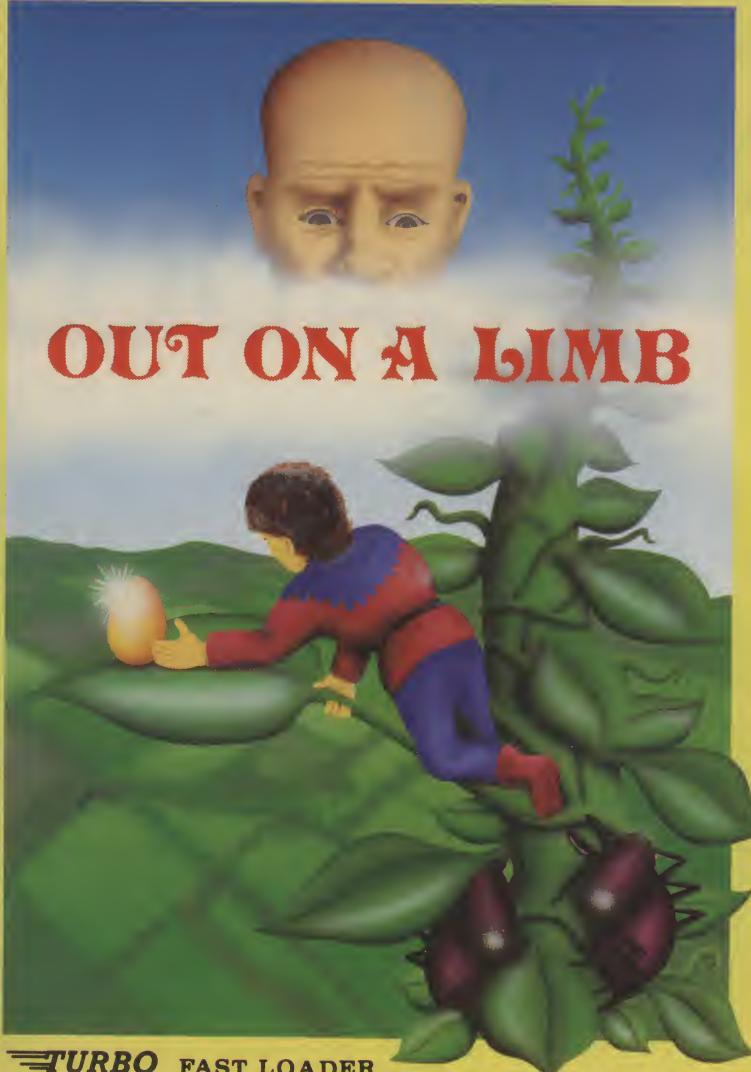
MOON BUGGY



FLIGHT PATH



OUT ON A LIMB



TURBO FAST LOADER

LAS VEGAS Las Vegas brings all the challenges of a deluxe arcade fruit machine direct to your fingertips. Many exciting features include, gamble, cancel, collect, nudge and number options, with a three row display and maximum payout of 20\$.

K.B. Only C.16 £6.95

ZODIAC This is an enthralling arcade adventure in which the evil powers of hell have scattered the signs of the Zodiac in the four hundred chambers of the abyss. Struggle to collect these signs and at the same time try to annihilate everything in your way. How long can you stay alive?

J.S. or K.B. C.16 £6.95

PETCH Race Petch around the screen, moving ice blocks to alter the maze, however, beware of the nasty monsters who are constantly chasing Petch as you attempt to collect the bonus cherries. Also if you can touch the edge of the maze the monsters will suddenly burst into flames, but look out they'll soon be back!

J.S. or K.B. C.16 £6.95

MOON BUGGY You must skillfully manoeuvre your jumping patrol vehicle over dangerous moon craters as well as large boulders and cunningly placed mines. Not only this but avoid the hovering alien spaceship as it bombs you from above.

J.S. or K.B. C.16 £6.95

3D TIME TREK As sole survivor of the planet "Corillian" your quest is one of anger and revenge. The starship you are flying is full of the latest inboard computers and extra powerful sensors. Also included are full 3D graphics, to add unbelievable realism to this fantastic journey through time itself, and beyond.

J.S. and K.B. C.16 £6.95

SKRAMBLE Earth has been overrun by the Cobrons and it's up to you to battle through the six ferocious and testing sectors. Adversaries include meteors, UFO's and deadly fireballs. Fly through an armoured city, then an elaborate maze and finally the command base itself.

J.S. or K.B. C.16 £6.95

FLIGHT PATH Flight Path is without doubt the best flight simulator on the C/16 and Amstrad. The many elaborate features include; Altimeter, flaps, directional headings, crosswinds, fires, ground warning lights and reverse thrust to name but a few. Also included are smooth graphics as you take off, cruise over mountains, and land once again.

J.S. and K.B. C.16 £6.95

OUT ON A LIMB This is a fantastic and in parts outrageously funny game. Based on the fairytale of Jack and the Beanstalk, Out On A Limb is full of the most strange and eccentric characters you are ever likely to meet. Firstly, climb the stalk and jump onto the clouds, then enter the giant's castle searching for treasures. However, watch out for vacuum cleaners, musical notes, televisions and potted plants, all of which chase you round the many and elaborate rooms of the castle. Once the treasure is collected the single exit will be opened, and then.....?

J.S. or K.B. C.16 £6.95

ZODIAC



3D TIME TREK



SKRAMBLE



ANIROG

Mail Order: 8 HIGH STREET HORLEY SURREY 24 HOUR CREDIT SALES HORLEY 02934 8083 Payment by: P.O. - ACCESS - VISA

AVAILABLE FROM YOUR COMPUTER STORE

T

OMMY'S TIPS

Tommy is Commodore User's resident know-all. Each month he burrows through a mountain of readers' mail and emerges with a handful of choice queries. The result, before you, is a wad of priceless information and indispensable advice. There's even the odd useful tip as well.

Dear Tommy, I am about to start writing a program for the Commodore 64, whose execution time I expect to be quite lengthy.

I hoped to shorten the runtime by using machine code instead of Basic, but, having just spent a week ploughing through a stack of books and manuals, I fear the task is far beyond me. Are there, therefore, any software packages that will take a program written entirely in Basic and rewrite them line by line into machine code?

What you need is a compiler. While a true compiler will indeed produce machine-code they tend to be rather expensive; what you get for micros are pseudo-compilers. These convert Basic to an intermediate code which is much more efficient than Basic; this code is then interpreted. The resulting program does run faster although nothing like as fast as a pure machine-code program. There are at least two compilers available for the 64: *Petspeed* from *Oxford Computer Systems* and *DTL-Basic 64 'Jetpack'* from *Dataview*. The increases claimed in the adverts are unlikely to be achieved in practice, but genuine speed gains of up to 10 times are not to be sneezed at. Prices are £15 for *DTL-Basic* (cassette version), £40 (disk version) and £50 for *Petspeed* (disk).

Dear Tommy, Please help! I am at my wit's end. I do not own a disk drive so I cannot solve the following program.

Recently I have written a program which looks like this: 10 SYS 849. I have tried to store the machine code from location 849 to 1020, but every time I load the program back in, the machine code is overwritten by the tape buffer. Please would you tell me how to save the program so that the machine code stays in the tape buffer when the program is reloaded. I have tried for weeks to solve this problem without any luck. I would be very grateful if you could help me.

There is no way you can store a machine-code program in the tape buffer if you want to use the tape recorder again! Anything



stored there will be overwritten as soon as you try to load, as you have discovered. You can try it the other way round, which is to load the Basic program first, which must include code to load the machine-code program. This way the machine-code will not be disturbed again after it has been put in the tape buffer. The **SYS** command must follow the **LOAD** command and will then activate the machine-code program in the normal way. The alternative is to store the machine-code at the top of memory; the Basic program can then be loaded and run as normal and provided you are not storing strings etc., does not need to alter any memory pointers.

Dear Tommy, I have a Vic-20 and I am having a problem with a Poke command. When I type in a program with the Poke number 36869,255 (as in Horse Race line 500 of your magazine *Commodore User* Dec. 84) the screen fills with lots of different characters and the program will not run. When I change the number to 36879,255 it will run. This also happens in other programs. Is there a problem with my Vic?

I also have a problem with a program I have typed in, it's called 'Three in a Row' (based on noughts and crosses). Can you tell me how to get the word 'Win' to flash on the screen when a winning line is made? I have used the Poke command to get the frame on the screen, and use the Get statement for the keys, e.g. key 'A' will put 'X' in square A1, and key 'B' will put 'U' in square A1.

Having looked at the program in question, there is nothing wrong with the original line 500. Address 36869 sets part of the video address (bits 4-7) and the start of the character memory (bits 0-3). Horse Races changes the character set to give the neat little horses, hence if you alter this line you will not be able to see the User Defined Graphics characters. I know it might sound a silly question, but you have removed all additional memory haven't you? This program (and others like it) will only work on the unexpanded or +3K Vic. If you have an 8K or 16K RAM pack plugged in you will get the peculiar results you mention. If this is not the case then I suggest you check the lines 5-75 again very carefully as these lines set up the alternative character location. Also ensure you haven't mixed up 1 and I; this being a common error.

On your second query, the following code will do what you want:

```
1000 FOR LOOP=1 TO 10
1020 PRINT"WIN<CUL3>";
1030 FOR DL=1 TO 500:
NEXT DL
1040 PRINT"<spc3><CUL3>";
1050 FOR DL=1 TO 500:
NEXT DL
1060 NEXT LOOP:PRINT
```

Note that <CUL3> is 3 cursor left keys and <spc3> is 3 spaces. Changing the values in lines 1030 and 1040 will alter the flash rate; altering the loop value will alter the number of times it flashes.

Dear Tommy, In the December issue of *Commodore User* in reply to a query concerning the 1520 printer-plottter, you

state that as the 1520 is set up as Device 6 it is therefore of no use for using with a word processor. But in the same issue a review by Chris Durham on the 1520 gives a method of inserting a link which will convert it to Device 4.

Could you please advise if after inserting the link the 1520 could be used for a word processor such as Vic-Writer. Thank you.

If you change the Device Number of the 1520 as explained in Chris Durham's article then you will be able to use it with most WP programs. The snag is that you will not be able to alter the print size, pen colour or other options because Vic-Writer can only send control codes that printers like the 1525 can recognise; the 1520 needs different types of commands to change its options. You are therefore limited to whatever is set on the 1520 before you load and run your WP program (i.e. if you want 80 columns then you must set the 1520 for 80 columns before loading your WP program).

Dear Tommy, A nice easy problem for you! I have decided to buy a disk drive for my Commodore 64 and would like to know which one to buy. I'll tell you what I know about Commodore drives.

1540 — too fast for 64
1541 — very slow

1542 — is this the new one for the 16 and Plus 4 and is it compatible with the 64?
Double drives — do they require an interface?

To begin with the drive will only be for my own programs but eventually I would hope to help run a business with my computer. Could you tell me what drive is best and why and also the reasons against the others?

Ah, a little history and some prophecy all in one query, eh? The history is that the 1540 is dead; long live the 1541. The 1540 was for the Vic-20 only. The 1541 replaced it to work with both the Vic and the 64. The 1542 is intended for use with the Plus-4 and 16, but is not yet available. I hear it will be compatible with the 64,

Commodore
Collection



Spectrum
Collection

ISBN No: 185096002X

ISBN No: 185096003X



Computer and Video Games, Britain's most popular computer games monthly, bring you two exciting new books for the Spectrum and Commodore 64.

Each 100-page book contains up to 30 **brand new** games checked and prepared by **Computer and Video Games**'s regular contributors.

At £2.99 reduced from £4.99 - the best value on the market at all good bookshops or send to EMAP Books, Bushfield House, Orton Centre, Peterborough PE2 0UW.

DON'T VAT THE PRESS

There are strong reasons to believe the Chancellor of the Exchequer is planning to impose VAT on your magazine. Such a move would turn the clock back 130 years — the last tax on newspapers and journals was repealed in 1855. Since then 'No tax on knowledge' has been a principle agreed by all Governments, even in the darkest days of war.

A free Press is a tax-free Press.

No Government should be given the power to impose financial pressure on a Press it may not like.

Tell your MP to say 'NO' to any tax on reading.

Issued by the Periodical Publishers Association, London

Can you afford to write for anyone else?



Leaders in Computer Games require
programs and programmers

1. Original game programs for the Spectrum or Commodore 64 are urgently required: Arcade, Strategy or Adventure. We pay top royalties or tailor a contract to suit your needs — WorldWide sales ensure the best possible deal.
2. Programmers to work in 280 or 6502 assembly language for contract work or translation coding — best rewards.



Write or phone in confidence to: Software Development, Ocean House, 6 Central Street, Manchester M2 5NS. 061-832 6633.

WHICH **MICRO**

COMMODORE 64 HANDBOOK
SPECTRUM HANDBOOK



ISBN No: 185096 0003

ISBN No: 185096 0011

Britain's two most popular personal computers, the Commodore 64 and Spectrum are covered from basic to semi-expert in **Which Micro Magazine's Handbooks**.

Author **Pete Gerrard**, a regular columnist for **Which Micro**, has put together an accurate and practical guide to both computers, reduced from £4.99 to £3.50 per book.

Many programs are included and both 160-page books are spiral bound for easy use and are available in all good bookshops from November or direct through your letterbox by sending to EMAP Books, Bushfield House, Orton Centre, Peterborough PE2 0UW.

Tommy's Tips

that uses the 'Hex' C000 memory area. You cannot Poke to the screen either, but apart from that it does allow you to get 40 columns in your own programs.

Dear Tommy, I wonder if you can help me. The cost of an 80 column card appears to be exceptionally high, a third or more of the cost of a Commodore 64 computer.

Is it possible to achieve 80 columns by means of software? If so, can I purchase such a program, alternatively can you provide any guidelines as to how I might write a suitable program. As I am an absolute novice the most useful advice would be to list a suitable textbook.

I regret that I have not been able to find any company producing such a program (if any company is marketing such a product, please let us know!). One of the problems you face is that no TV set will display 80 columns; nor will the Commodore Colour Monitor do it clearly. You need a monochrome monitor. If you are a complete novice I would hesitate to recommend that you tackle anything quite as complex as this since it will involve a good working knowledge of both machine code and the 64's operating system. Not only that, but unless you are very clever indeed no commercial software will run on your 64 with 80-columns as it will probably not be compatible. Even the hardware boards can normally only work with software written specifically for them (unless only PRINT statements are used). If you really cannot manage without 80 columns then I am afraid that a hardware solution is the only real answer — or buy another computer.

One final point: apart from the 8250 the data storage on Commodore disks is not large — 170K each. Unless your business use is going to be fairly small you might be better off buying a new business system complete and just getting a 1541 for use at home.

but knowing Commodore I won't take bets. As for dual drives, the Commodore 4040 would be the thing to go for if you could get one, as it is fully read compatible with the 1541, but they don't make them any more! However, there are still some available on the second-hand market at around £350 and you will need a £45-£60 interface plus a £35 cable in order to use it.

So what's best? The 1541 is the obvious choice because it is cheap (inexpensive anyway!), does not require an interface or expensive cables and will run all the commercial programs on disk for the 64. Its disadvantages are that it is slow, occasionally unreliable and you cannot run two single drives together for longer than about 12 minutes before they hang up. If you are intending to use them for business later on, my reaction would be to go for a dual drive, but the only dual drive currently available from Commodore is the 8250; a 2Mbyte dual sided, dual density drive that is not read compatible with 1541 disks. The result is that much of the available software will be denied to you, unless the suppliers will reformat the programs onto an 8250 disk. As for personal recommendation, I have just changed from two 1541 drives to a dual 4040 using INTERPOD. I had been on the lookout for a good one for 6 months though, so you may or may not be lucky.

One final point: apart from the 8250 the data storage on Commodore disks is not large — 170K each. Unless your business use is going to be fairly small you might be better off buying a new business system complete and just getting a 1541 for use at home.

Dear Tommy, Is there any way of expanding the screen on my Vic-20 to 40 columns without spending a lot of money on an expansion board? There must be a cheaper alternative.

I've had quite a lot of queries from people wanting to expand the Vic 20 screen to 40 columns using software. I would like to thank Theodor Schmidt of Dorset for drawing my attention to a program called Super Screen from Audiogenic. It costs £9.95, needs at least 8K expansion RAM and will not work with any cartridge

that uses the 'Hex' C000 memory area. You cannot Poke to the screen either, but apart from that it does allow you to get 40 columns in your own programs.

First of all, are you sure that the two programs will work together?

Superbase 64

The natural development for Commodore 64 users

Unlock the full potential of your disk-based Commodore 64, use Superbase 64 — the complete records-handling system that puts business-style power and practicality at your fingertips.

Superbase 64 solves a host of filing problems with its easy record formatting, powerful indexing and sorting, extensive outputting options, and its 'Superbasic' programming capability.

- Invoices
- Finance & Banking
- Collections
- Recipes
- Personal Filing
- Stock
- Prospects
- Management Accounts
- Car Fleet Records
- and many, many more!

Superbase 64

— The complete information control system for the Commodore 64 includes a simple-to-follow manual.

Complete your Commodore 64 — Complete the coupon

More information on Superbase 64 is available from Commodore Dealers, Major Retailers or from Precision Software direct.

From the authors of Easy Script.

Please send me more information on Superbase 64.

Name _____ Tel _____

Address _____ Age _____

Occupation _____

Precision Software Ltd. 6 Park Terrace, Worcester Park, Surrey, KT4 7JZ

Tel: 01-330 7166

Telex: 8955021

PRECIS G

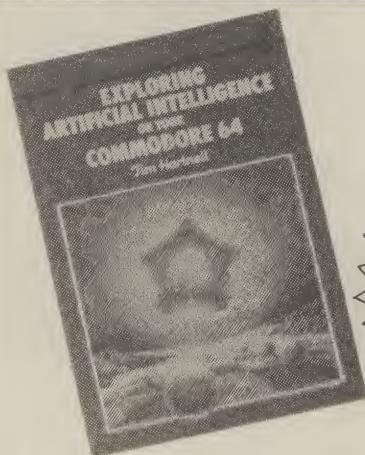
Precision Software



Now with Audio Learning Cassette



MAKE THE MOST OF YOUR COMPUTER.



NEW!

<input type="checkbox"/> Exploring Artificial Intelligence on your COMMODORE 64	Tim Hartnell.	£6.95
<input type="checkbox"/> Mastering Machine Code on your Commodore 64	Mark Greenshields.	£7.95
<input type="checkbox"/> Mastering the Commodore 64	Mark Greenshields.	£7.95
<input type="checkbox"/> Challenging Games for the Commodore 64	William A Roberts.	£3.95
<input type="checkbox"/> Putting your Commodore 64 to Work (15 programs, including a complete word processor)	Chris Callender.	£4.95
<input type="checkbox"/> Putting your VIC 20 to Work	Tom Lau.	£4.95
<input type="checkbox"/> 50 Outstanding Programs for the VIC 20	Tim Hartnell.	£6.95
<input type="checkbox"/> Delving Deeper into your VIC 20	Philip Campbell.	£4.95
<input type="checkbox"/> Dynamic Games for your VIC 20	Mathew Boek.	£4.95
<input type="checkbox"/> Creating Adventure Programs on your Computer	Andrew Nelson.	£4.95
<input type="checkbox"/> The Art of Structured Programming	Peter Juliff.	£5.95
<input type="checkbox"/> The Easy Way to Program your New Computer	Tim Hartnell.	£3.95
<input type="checkbox"/> Getting Acquainted with your VIC 20	Tim Hartnell.	£6.95
<input type="checkbox"/> How to Program the Commodore 64	Robert Young.	£5.95

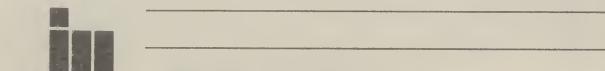
These books are available from most book and computer stores. In case of difficulty, order directly from us.

Interface Publications, Dept. QC
9-11 Kensington High Street, London W8 5NP.

Please send me the indicated books. I enclose £ _____

Name _____

Address _____



Interface Publications Ltd

Interface
(TRADE ONLY: Interface Publications are distributed exclusively in the UK and Eire by W H S Distributors. Export trade handled by Interface Publications.)

T

OMMY'S TIPS

plug of the RF modulator have become very loose and this affects the picture and sound. As the guarantee has expired, please could you tell me if Commodore supply spare parts, and an address to write to.

If it is just a question of the wires coming loose in the plug then any TV/radio repair shop will be able to fix it for you. If the cable is damaged then you could get them to fit a new cable which will be much cheaper than ordering a new modulator from Commodore (always assuming they agree to supply one!). If you find that it is the modulator and not the cable that is faulty, Commodore's new address is as follows:

Commodore Business Machines (UK) Ltd.,

1 Hunters Road,
Weldon,
Corby,

Northamptonshire NN17 1QX
Tel: 0536 205555.

I assume that the latter program is a machine-code routine which is loaded before running the *Unifile* program and is run using a 'SYS' command. I also assume that the data is stored in an array (arrays?) in which case addresses 47 & 48 will point to the start of the data area and addresses 49 & 50 will point to the end (e.g. PEEK (48)*256 + PEEK (47) will give you the address of the start of the Basic arrays). If the data is likely to include single variables as well then to be safe you should save the variables area too, the start of which is pointed to by addresses 45 & 46.

Although saving would be possible after exiting from *Unifile*, loading should really be done from within the program. Your best bet is to alter *Unifile* so that it will load the *Compute* machine-code program into memory and also add the necessary code to invoke the relevant SYS calls. This way you will retain a completely integrated program.

Dear Tommy, I have a problem with my Commodore 64 which I hope you could help with. In the August issue, page 22, David Bolton reviewed the book 'Sprite Graphics for the Commodore 64'. In his review he talks about 'sparkle'. My Commodore 64 has this problem. Could you please tell me how I can get rid of this 'sparkle'. Thank you very much.

As far as I can discover there is no way of getting rid of it. It only seems to affect the older 64s; newer ones seem to have had the problem sorted out by Commodore. I had the problem with my previous 64 to a certain extent and reduced it, but didn't clear it completely, by fine tuning the video modulator. You must bear in mind though that this only reduces the effect on the screen; other effects such as the one mentioned in the review can still occur. (If any reader is aware of a way of completely overcoming it, please let us know.)

Dear Tommy, I have had my Vic-20 for almost two years and have enjoyed using it to date. However, in the last few months the wires in the video

Dear Tommy, After reading about people's problems when using Pokes with a 16K Ram pack, I have decided to send you these Pokes. They can be used in direct or indirect mode.

POKE648,30: POKE642,32
POKE641,0: SYS64824

The above allows you to use all the values of an unexpanded Vic, with a 16K Ram pack connected (including screen locations).

Can you help? I wish to know if it is possible to use a bought game, 3K (possibly machine code) with a Super-Expander cartridge, not a 3K Ram pack. I don't want to buy a game needing 3K before I know that I can use it.

I am afraid that the answer can only be a qualified 'yes'. The problem is that you get just slightly less memory when using a Super Expander than you do with a standard 3K RAM pack. This is because the cartridge itself uses some of the memory. The result is that if the game has been shoehorned in to run on a 3K expansion it may NOT work with a Super Expander cartridge fitted.

On the other hand, some software houses ensure that their programs will run with either, by limiting the games to the smaller of the two sizes of memory. I suggest you ask your supplier when you buy the game; he may be willing to load it in the shop to check, but provided you make it a condition of sale he should be willing to exchange it if it will not run.



You should see what he's just seen.

Micronet 800.

Stretching the mind of your micro far beyond its limits.

Micro evolution continues with this unique communications, informations and software system. Set on our mainframes nationwide.

Includes 30,000 pages and access to Prestel™ with its full range of services.

A tremendous Communications section that networks you to thousands of other members across the country. Send and receive electronic messages and graphics at a touch of a button.

And there's the Chatline service, Swapshop and Teleshopping.

Check with daily updates on the very latest computer news.

Micronet also has its own huge facts data base.

And a choice of up-to-the-minute software to download absolutely free.

For only £13 a quarter and just a local telephone call whenever you want to connect up (that's only 22p per half hour at cheap rates) you could be part of Micronet.

The only accessory you need is a Modem.

A small price to pay to join the other visionaries on this exciting new system.



Fill in the coupon for more details and send to Micronet 800, Durrant House, 8 Herbal Hill, London EC1R 5EJ.

But be warned, Micronet 800's features are almost limitless and constantly updating. So maybe you'd be better to call in at Laskys, John Lewis, main Boots or your local Micronet 800 Action Station.

To feast your eyes on all the amazing things it can do.

To: MICRONET 800, Durrant House, 8 Herbal Hill, London EC1R 5EJ. Telephone 01-278 3143.
Please send me the full facts about Micronet 800.

Name _____

Make/Model of Micro _____

Address _____

Telephone _____

For 97% of telephone users.

™Prestel is a trademark of British Telecommunications.

On Prestel

CU3

See Micronet 800 in action.

AVON	DEVON	KENT	MERSEYSIDE	SURREY	
<p>Bath. Boots, 1 Merchants Passage, Southgate. Tel: 0225 64402.</p> <p>Bristol. Avon Computer Rentals, 16 West Street, Old Market. Tel: 0272 556000.</p> <p>Bristol. Boots, 59 Broadmead. Tel: 0272 293631.</p> <p>Bristol. Boots, 16-20 Penn Street. Tel: 0272 20421.</p> <p>Keynsham. Key Computer Systems, 425 High Street. Tel: 02756 5575.</p> <p>Weston-super-Mare. K & K Computers, 32 Alfred Street. Tel: 0934 419324.</p>	<p>Exeter. Boots, 251 High Street, Tel: 0392 32244.</p> <p>Exeter. Open Channel, Central Station, Queen Street. Tel: 0392 218187.</p> <p>Paignton. Computer Systems Ltd, 35 Hyde Road. Tel: 0803 524284.</p> <p>Plymouth. Syntax, 76 Cornwall Street. Tel: 0752 28705.</p> <p>Seaton. Curtis Computer Services, Seaton Computer Shop, 51c Harbour Road. Tel: 0297 22347.</p> <p>Tiverton. Actron Microcomputers, 37 Tiverton Street. Tel: 0884 252854.</p>	<p>Exeter. Boots, 251 High Street, Tel: 0634 405471.</p> <p>Gravesend. Gravesend Home Computers, 39 The Terrace. Tel: 0474 23871.</p> <p>Gillingham. Regal Software Supplies, 49 High Street. Tel: 0634 579634.</p> <p>Maidstone. Kent Micros, 51 Union Street. Tel: 0622 52784.</p> <p>Rainham. Microway Computers, 39 High Street. Tel: 0634 376702.</p> <p>Sevenoaks. Ernest Fielder Computers, Dorset Street. Tel: 0732 456800.</p> <p>Shortlands. The Village House of Computers, 87 Beckenham Lane. Tel: 01-460 7122.</p> <p>Sittingbourne. Computer Plus, 65 High Street. Tel: 0795 25677.</p> <p>Tunbridge Wells. Modata Computer Centre, 28-30 St. Johns Road. Tel: 0802 41555.</p>	<p>Heswall. Thornguard Computer Systems, 46 Pensby Road. Tel: 051-342 7516.</p> <p>Liverpool. Hargreaves, 31-37 Warbreck Moor, Walton. Tel: 051-525 1782.</p> <p>Liverpool. Laskys, Dale Street. Tel: 051-236 3298.</p> <p>Liverpool. Laskys, St. Johns Precinct. Tel: 051-708 5871.</p> <p>St. Helens. Microman Computers, Rainford Industrial Estate, Mill Lane Rainford. Tel: 0744 885242.</p> <p>Southport. Central Studios, 38 Eastbank Street. Tel: 0704 31881.</p>	<p>Woking. Harpers, 71-73 Commercial Way. Tel: 0486 225657.</p>	
<p>BEDFORDSHIRE</p> <p>Bedford. Boots, The Harpur Centre, Harpur Street. Tel: 0234 56231.</p> <p>Dunstable. Dormans, 7-11 Broad Walk. Tel: 0582 38302.</p> <p>Leighton Buzzard. Datasine, 59 North Street. Tel: 0525 374200.</p> <p>Leighton Buzzard. Milton Keynes Music & Computers, 17 Bridge Street. Tel: 0525 382504.</p> <p>Luton. Hobbyte, Unit 16, The Arndale Centre. Tel: 0582 457195.</p> <p>Luton. Laskys, 190-192 Arndale Centre. Tel: 0582 38302.</p> <p>Luton. Terry More, 49 George Street. Tel: 0582 23391.</p>	<p>Bournemouth. Brook Computers, 370 Charminster Road. Tel: 0202 533054.</p> <p>Bournemouth. Lansdowne Computer Centre, 1 Lansdowne Crescent, Lansdowne. Tel: 0202 20165.</p> <p>Dorchester. The Paper Shop, Kings Road. Tel: 0305 64564.</p> <p>Poole. Lansdowne Computer Centre, 14 Arndale Centre. Tel: 0202 670901.</p>	<p>ESSEX</p> <p>Basildon. Basildon Software Centre, 78-80 Liberty Shopping Hall, East Square. Tel: 0268 27922.</p> <p>Chelmsford. Maxton Hayman, 5 Broomfield Road. Tel: 0245 354595.</p> <p>Chelmsford. Way In Computers, 7 Village Square, Chelmer Village. Tel: 0245 467858.</p> <p>Colchester. Boots, 5-6 Lion Walk. Tel: 0206 577303.</p> <p>Grays. H. Reynolds, 28a Southend Road. Tel: 0375 31641.</p> <p>Harlow. Harlow Computer Centre, 17 Staple Tie. Tel: 0279 22846.</p> <p>Harlow. Laskys, 19 The Harvey Centre. Tel: 0279 443495.</p> <p>Hornchurch. Comptel Computer Systems, 112a North Street. Tel: 0402 446741.</p> <p>Iford. Boots, 177-185 High Road. Tel: 01-553 2116.</p> <p>Romford. Software Plus, 72 North Street. Tel: 07 65271.</p> <p>Southend-on-Sea. Computerama, 88 London Road. Tel: 0702 335443.</p> <p>Southend-on-Sea. Computer Centre, 336 London Road. Tel: 0702 337161.</p>	<p>LANCASHIRE</p> <p>Blackburn. Tempo Computers, 9 Railway Road. Tel: 0254 691333.</p> <p>Blackpool. Blackpool Computer Store, 179 Church Street. Tel: 0253 20239.</p> <p>Burnley. IMO Business Systems, 39-43 Standish Street. Tel: 0282 54299.</p> <p>Preston. 4Mat Computing, 67 Friargate. Tel: 0772 561952.</p> <p>Preston. Laskys, 1-4 Guildhall Arcade. Tel: 0772 24558.</p> <p>Wigan. Wildings Computer Centre, 11 Mesnes Street. Tel: 0942 22382.</p>	<p>LEICESTERSHIRE</p> <p>Leicester. Boots, 30-36 Gallowtree Gate. Tel: 0533 21641.</p> <p>Market Harborough. Harborough Home Computers, 7 Church Street. Tel: 0858 63056.</p>	<p>NORFOLK</p> <p>Norwich. Adams, 125-129 King Street. Tel: 0603 22129.</p>
<p>BUCKINGHAMSHIRE</p> <p>Bletchley. RAMS Computer Centre, 117 Queensway. Tel: 0908 647744.</p> <p>Chesham. Reed Photo & Computers, 113 High Street. Tel: 0949 783373.</p>	<p>Cambridge. Boots, 65-67 Sidney Street and 28 Petty Curry Street. Tel: 0223 350213.</p> <p>Cambridge. Cambridge Computer Store, 4 Emmanuel Street. Tel: 0223 358264.</p> <p>Cambridge. Heffers Stationers, 19 Sidney Street. Tel: 0223 358241.</p> <p>Peterborough. Boots, 40-42 Bridge Street, Queensgate. Tel: 0733 65352.</p>	<p>W1. Computers of Wigmore Street, 104 Wigmore Street. Tel: 01486 0373.</p> <p>W1. HMV, 363 Oxford Street. Tel: 01-629 1240.</p> <p>W1. Laskys, 42 Tottenham Court Road. Tel: 01-636 0845.</p> <p>W1. Lion House, 227 Tottenham Court Road. Tel: 01-637 1601.</p> <p>W1. Sonic Foto Micro Center, 256 Tottenham Court Road. Tel: 01-580 5826.</p> <p>W1. Tomorrows World Today, 27 Oxford Street. Tel: 01-439 7799.</p> <p>W1. Walters Computers, DH Evans, Oxford Street. Tel: 01-629 8800.</p> <p>WC1. Transam Micro Systems, 59-61 Theobalds Road. Tel: 01-405 5240.</p> <p>W8. Walters Computers, Barkers, Kensington High Street. Tel: 01-937 5432.</p> <p>SE7. Vic Ondens Micros, 5 London Bridge Walk. Tel: 01-403 1988.</p>	<p>NOTTINGHAMSHIRE</p> <p>Sutton in Ashfield. HN & L Fisher, 87 Outram Street. Tel: 0623 547349.</p> <p>Nottingham. Laskys, 1-4 Smythys Row. Tel: 0602 413049.</p>	<p>OXFORDSHIRE</p> <p>Abingdon. Ivo Fields Computers, 21 Stern Street. Tel: 0235 21207.</p> <p>Banbury. Computer Plus, 2 Church Lane. Tel: 0295 55890.</p> <p>Oxford. Absolute Sound & Video, 19 Old High Street, Headington. Tel: 0865 65661.</p> <p>Oxford. Science Studio, 7 Little Clarendon Street. Tel: 0865 54022.</p>	<p>WALES</p> <p>Aberdare. Inkey Computer Services, 70 Mill Street, The Square, Trecoydon. Tel: 0685 881828.</p> <p>Aberystwyth. Aberdata at Galloways, 23 Pier Street. Tel: 0970 615522.</p> <p>Cardiff. Boots, 26 Queens Street & 105 Frederick Street. Tel: 0222 31291.</p> <p>Cardiff. P & P Computers, 41 The Hayes. Tel: 0222 26666.</p>
<p>CAMBRIDGESHIRE</p> <p>Cambridge. Boots, 65-67 Sidney Street and 28 Petty Curry Street. Tel: 0223 350213.</p> <p>Cambridge. Cambridge Computer Store, 4 Emmanuel Street. Tel: 0223 358264.</p> <p>Cambridge. Heffers Stationers, 19 Sidney Street. Tel: 0223 358241.</p> <p>Peterborough. Boots, 40-42 Bridge Street, Queensgate. Tel: 0733 65352.</p>	<p>Cheltenham. Laskys, 206 High Street. Tel: 0242 570282.</p> <p>Cheltenham. Screen Scene, 144 St. Georges Road. Tel: 0242 528979.</p> <p>Gloucester. Boots, 38-46 Eastgate Street. Tel: 0452 423501.</p>	<p>Gloucester.</p> <p>HAMPSHIRE</p> <p>Basingstoke. Fishers, 2-3 Market Place. Tel: 0265 22079.</p> <p>Southampton. Business Electronics, Micromagic At Atkins, 7 Civic Centre Road. Tel: 0703 25903.</p> <p>Waterlooville. GB Microland, 7 Queens Parade, London Road. Tel: 0705 259911.</p>	<p>W2. Computers of Wigmore Street, 104 Wigmore Street. Tel: 01486 0373.</p> <p>W1. HMV, 363 Oxford Street. Tel: 01-629 1240.</p> <p>W1. Laskys, 42 Tottenham Court Road. Tel: 01-636 0845.</p> <p>W1. Lion House, 227 Tottenham Court Road. Tel: 01-637 1601.</p> <p>W1. Sonic Foto Micro Center, 256 Tottenham Court Road. Tel: 01-580 5826.</p> <p>W1. Tomorrows World Today, 27 Oxford Street. Tel: 01-439 7799.</p> <p>W1. Walters Computers, DH Evans, Oxford Street. Tel: 01-629 8800.</p> <p>WC1. Transam Micro Systems, 59-61 Theobalds Road. Tel: 01-405 5240.</p> <p>W8. Walters Computers, Barkers, Kensington High Street. Tel: 01-937 5432.</p> <p>SE7. Vic Ondens Micros, 5 London Bridge Walk. Tel: 01-403 1988.</p>	<p>WORCESTERSHIRE</p> <p>Shrewsbury. Clairmont Enterprises, Hills Lane. Tel: 3647 52949.</p> <p>Shrewsbury. Computerama, 13 Castlegate. Tel: 0743 60528.</p> <p>Telford. Computer Village Ltd, 2/3 Hazelined House, Central Square. Tel: 0952 506771.</p> <p>Telford. Telford Electronics, 38 Mall 4. Tel: 0952 504911.</p>	<p>SCOTLAND</p> <p>Aberdeen. Boots, 133-141 Union Street. Tel: 0224 585349.</p> <p>Edinburgh. Boots, 101-103 Princes Street. Tel: 031-225 8331.</p> <p>Edinburgh. Laskys, 4 St. James Centre. Tel: 031-556 1864.</p> <p>Glasgow. Boots, 200 Sauchiehall Street. Tel: 041-332 1925.</p> <p>Glasgow. Boots, Union Street and Argyle Street. Tel: 041-248 7387.</p> <p>Glasgow. Tom Dixon Cameras, 15-17 Queen Street. Tel: 041-204 0826.</p>
<p>CHESHIRE</p> <p>Chester. Boots, 47-55 Foregate Street. Tel: 0244 28421.</p> <p>Chester. Computer Link, 21 St. Werburgh Street. Tel: 0244 316516.</p> <p>Chester. Laskys, 7 The Forum, Northgate Street. Tel: 0244 317667.</p> <p>Crewe. Midshires Computer Centre, 68-78 Nantwich Road. Tel: 0270 211086.</p>	<p>Southend-on-Sea. Estuary Personal Computers, 318 Chartwell North, Victoria Circus Shopping Centre. Tel: 0702 614131.</p>	<p>Gloucester.</p> <p>HERTFORD</p> <p>Hitchin. County Computers, 13 Bucklesbury. Tel: 0462 36757.</p> <p>Potters Bar. The Computer Shop, 107 High Street. Tel: 0707 44417.</p> <p>Stevenage. DJ Computers, 11 Town Square. Tel: 0438 65501.</p> <p>Watford. Laskys, 18 Charter Place. Tel: 0923 31905.</p> <p>Watford. SRS Microsystems, 94 The Parade, High Street. Tel: 0923 26602.</p> <p>Watford. Watford Electronics, Cardiff Road. Tel: 0923 405588.</p> <p>Welwyn Garden City. DJ Computers, 40 Fetherne Road. Tel: 96 28444.</p>	<p>W2. Computers of Wigmore Street, 104 Wigmore Street. Tel: 01486 0373.</p> <p>W1. HMV, 363 Oxford Street. Tel: 01-629 1240.</p> <p>W1. Laskys, 42 Tottenham Court Road. Tel: 01-636 0845.</p> <p>W1. Lion House, 227 Tottenham Court Road. Tel: 01-637 1601.</p> <p>W1. Sonic Foto Micro Center, 256 Tottenham Court Road. Tel: 01-580 5826.</p> <p>W1. Tomorrows World Today, 27 Oxford Street. Tel: 01-439 7799.</p> <p>W1. Walters Computers, DH Evans, Oxford Street. Tel: 01-629 8800.</p> <p>WC1. Transam Micro Systems, 59-61 Theobalds Road. Tel: 01-405 5240.</p> <p>W8. Walters Computers, Barkers, Kensington High Street. Tel: 01-937 5432.</p> <p>SE7. Vic Ondens Micros, 5 London Bridge Walk. Tel: 01-403 1988.</p>	<p>SHROPSHIRE</p> <p>Shrewsbury. Clairmont Enterprises, Hills Lane. Tel: 3647 52949.</p> <p>Shrewsbury. Computerama, 13 Castlegate. Tel: 0743 60528.</p> <p>Telford. Computer Village Ltd, 2/3 Hazelined House, Central Square. Tel: 0952 506771.</p> <p>Telford. Telford Electronics, 38 Mall 4. Tel: 0952 504911.</p>	<p>WEST MIDLANDS</p> <p>Birmingham. Boots, City Centre House, 16-17 New Street. Tel: 021-643 7582.</p> <p>Birmingham. Laskys, 19-21 Corporation Street. Tel: 021-632 6303.</p> <p>Dudley. Central Computers, 35 Churchill Precinct. Tel: 0384 238169.</p> <p>Stourbridge. Walters Computer Systems, 12 Hagley Road. Tel: 0384 370811.</p> <p>Walsall. New Horizon, 1 Goodall Street. Tel: 0922 24821.</p>
<p>CLEVELAND</p> <p>Middlesbrough. Boots, 88-90 Linthorpe Road, The Cleveland Centre. Tel: 0642 249616.</p>	<p>Widnes. Wilmot Micro Centre, 62 Grove Street. Tel: 0625 530890.</p>	<p>HUMBERSIDE</p> <p>Beverley. Computing World, 10 Swabys Yard, Dyer Lane. Tel: 0482 881831.</p>	<p>MANCHESTER</p> <p>Bolton. Computer World UK Ltd, 208 Chorley Old Road. Tel: 0204 494304.</p> <p>Manchester. Boots, 32 Market Street. Tel: 061-832 6533.</p> <p>Manchester. Laskys, 61 Arndale Centre. Tel: 061-833 9149.</p> <p>Manchester. Laskys, 12-14 St. Marys Gate. Tel: 061-833 0268.</p> <p>Manchester. Mighty Micro, Sherwood Centre, 268 Wilmslow Road, Fallowfield. Tel: 061-224 8117.</p> <p>Manchester. NSC Computer Shops, 29 Hanging Ditch. Tel: 061-832 2269.</p> <p>Manchester. Walters Computers, Kendal Milne, Deansgate. Tel: 061-832 3414.</p> <p>Oldham. Home & Business Computers, 54 Yorkshire Street. Tel: 061-633 1608.</p> <p>Swinton. Mr Micro, 69 Partington Lane. Tel: 061-728 2282.</p>	<p>STAFFORDSHIRE</p> <p>Newcastle-under-Lyme. Computer Cabin, 24 The Parade, Silverdale. Tel: 0782 636911.</p> <p>Stafford. Computerama, 59 Foregate Street. Tel: 0785 41899.</p> <p>Stoke-on-Trent. Computerama, 11 Market Square Arcade, Hanley. Tel: 0782 268524.</p>	<p>YORKSHIRE</p> <p>Bradford. Boots, 11 Darley Street. Tel: 0274 390891.</p> <p>Leeds. Boots, 19 Albion Arcade, Bond Street Centre. Tel: 0532 33551.</p> <p>Sheffield. Laskys, 58 Leopold Street. Tel: 0742 750971.</p> <p>York. York Computer Centre, 7 Stongate Arcade. Tel: 0904 641862.</p>
<p>CUMBRIA</p> <p>Kendal. The Kendal Computer Centre, Stramongate. Tel: 0539 22559.</p> <p>Penrith. Penrith Communications, 14 Castlegate. Tel: 0768 67146.</p> <p>Whitehaven. P D Hendren, 15 King Street. Tel: 0946 2063.</p> <p>Workington. Technology Store, 12 Finkle Street. Tel: 0900 66972.</p>	<p>Exeter. Boots, 251 High Street, Tel: 0392 32244.</p> <p>Exeter. Open Channel, Central Station, Queen Street. Tel: 0392 218187.</p> <p>Paignton. Computer Systems Ltd, 35 Hyde Road. Tel: 0803 524284.</p> <p>Plymouth. Syntax, 76 Cornwall Street. Tel: 0752 28705.</p> <p>Seaton. Curtis Computer Services, Seaton Computer Shop, 51c Harbour Road. Tel: 0297 22347.</p> <p>Tiverton. Actron Microcomputers, 37 Tiverton Street. Tel: 0884 252854.</p>	<p>Exeter. Boots, 251 High Street, Tel: 0634 405471.</p> <p>Gravesend. Gravesend Home Computers, 39 The Terrace. Tel: 0474 23871.</p> <p>Gillingham. Regal Software Supplies, 49 High Street. Tel: 0634 579634.</p> <p>Maidstone. Kent Micros, 51 Union Street. Tel: 0622 52784.</p> <p>Rainham. Microway Computers, 39 High Street. Tel: 0634 376702.</p> <p>Sevenoaks. Ernest Fielder Computers, Dorset Street. Tel: 0732 456800.</p> <p>Shortlands. The Village House of Computers, 87 Beckenham Lane. Tel: 01-460 7122.</p> <p>Sittingbourne. Computer Plus, 65 High Street. Tel: 0795 25677.</p> <p>Tunbridge Wells. Modata Computer Centre, 28-30 St. Johns Road. Tel: 0802 41555.</p>	<p>Heswall. Thornguard Computer Systems, 46 Pensby Road. Tel: 051-342 7516.</p> <p>Liverpool. Hargreaves, 31-37 Warbreck Moor, Walton. Tel: 051-525 1782.</p> <p>Liverpool. Laskys, Dale Street. Tel: 051-236 3298.</p> <p>Liverpool. Laskys, St. Johns Precinct. Tel: 051-708 5871.</p> <p>St. Helens. Microman Computers, Rainford Industrial Estate, Mill Lane Rainford. Tel: 0744 885242.</p> <p>Southport. Central Studios, 38 Eastbank Street. Tel: 0704 31881.</p>	<p>Woking. Harpers, 71-73 Commercial Way. Tel: 0486 225657.</p>	
<p>DERBYSHIRE</p> <p>Alfreton. Gordon Harwood, 67-71 High Street. Tel: 0733 836781.</p> <p>Chesterfield. Boots, 35-37 Low Pavement, Market Place. Tel: 0246 203591.</p> <p>Chesterfield. Computer Stores, 14 Stephenson Place. Tel: 0246 208802.</p> <p>Derby. Boots, 1 Devonshire Walk. Tel: 0322 45886.</p>	<p>Exeter. Boots, 251 High Street, Tel: 0392 32244.</p> <p>Exeter. Open Channel, Central Station, Queen Street. Tel: 0392 218187.</p> <p>Paignton. Computer Systems Ltd, 35 Hyde Road. Tel: 0803 524284.</p> <p>Plymouth. Syntax, 76 Cornwall Street. Tel: 0752 28705.</p> <p>Seaton. Curtis Computer Services, Seaton Computer Shop, 51c Harbour Road. Tel: 0297 22347.</p> <p>Tiverton. Actron Microcomputers, 37 Tiverton Street. Tel: 0884 252854.</p>	<p>Exeter. Boots, 251 High Street, Tel: 0634 405471.</p> <p>Gravesend. Gravesend Home Computers, 39 The Terrace. Tel: 0474 23871.</p> <p>Gillingham. Regal Software Supplies, 49 High Street. Tel: 0634 579634.</p> <p>Maidstone. Kent Micros, 51 Union Street. Tel: 0622 52784.</p> <p>Rainham. Microway Computers, 39 High Street. Tel: 0634 376702.</p> <p>Sevenoaks. Ernest Fielder Computers, Dorset Street. Tel: 0732 456800.</p> <p>Shortlands. The Village House of Computers, 87 Beckenham Lane. Tel: 01-460 7122.</p> <p>Sittingbourne. Computer Plus, 65 High Street. Tel: 0795 25677.</p> <p>Tunbridge Wells. Modata Computer Centre, 28-30 St. Johns Road. Tel: 0802 41555.</p>	<p>Heswall. Thornguard Computer Systems, 46 Pensby Road. Tel: 051-342 7516.</p> <p>Liverpool. Hargreaves, 31-37 Warbreck Moor, Walton. Tel: 051-525 1782.</p> <p>Liverpool. Laskys, Dale Street. Tel: 051-236 3298.</p> <p>Liverpool. Laskys, St. Johns Precinct. Tel: 051-708 5871.</p> <p>St. Helens. Microman Computers, Rainford Industrial Estate, Mill Lane Rainford. Tel: 0744 885242.</p> <p>Southport. Central Studios, 38 Eastbank Street. Tel: 0704 31881.</p>	<p>Woking. Harpers, 71-73 Commercial Way. Tel: 0486 225657.</p>	
<p>SUSSEX</p> <p>Bexhill-on-Sea. Computerware, 22 St. Leonards Road. Tel: 0424 223340.</p> <p>Brighton. Boots, 129 North Street. Tel: 0273 27088.</p> <p>Brighton. Game, 71 East Street. Tel: 0273 728681.</p> <p>Crawley. Gatwick Computers, 62 The Boulevard. Tel: 0293 37842.</p> <p>Crawley. Laskys, 6-8 Queensway. Tel: 0293 544622.</p> <p>Eastbourne. Boots, 15 Eastbourne Arndale Centre. Tel:</p>	<p>BEXHILL-ON-SEA. Computerware, 22 St. Leonards Road. Tel: 0424 223340.</p> <p>BRIGHTON. Boots, 129 North Street. Tel: 0273 27088.</p> <p>BRIGHTON. Game, 71 East Street. Tel: 0273 728681.</p> <p>CRAWLEY. Gatwick Computers, 62 The Boulevard. Tel: 0293 37842.</p> <p>CRAWLEY. Laskys, 6-8 Queensway. Tel: 0293 544622.</p> <p>EASTBOURNE. Boots, 15 Eastbourne Arndale Centre. Tel:</p>	<p>TYN & WEAR</p> <p>Gateshead. DP Supplies, St. Andrews House, Westfield Terrace. Tel: 0632 785068.</p> <p>Newcastle-upon-Tyne. Boots, Eldon Square. Tel: 0632 329844.</p> <p>Newcastle-upon-Tyne. Laskys, 6 Northumberland Street. Tel: 0632 617224.</p> <p>Newcastle-upon-Tyne. RE Computing, 12 Jesmond Road. Tel: 0632 815580.</p>	<p>TYN & WEAR</p> <p>Gateshead. DP Supplies, St. Andrews House, Westfield Terrace. Tel: 0632 785068.</p> <p>Newcastle-upon-Tyne. Boots, Eldon Square. Tel: 0632 329844.</p> <p>Newcastle-upon-Tyne. Laskys, 6 Northumberland Street. Tel: 0632 617224.</p> <p>Newcastle-upon-Tyne. RE Computing, 12 Jesmond Road. Tel: 0632 815580.</p>	<p>WALSHIRE</p> <p>Aberdare. Inkey Computer Services, 70 Mill Street, The Square, Trecoydon. Tel: 0685 881828.</p> <p>Aberystwyth. Aberdata at Galloways, 23 Pier Street. Tel: 0970 615522.</p> <p>Cardiff. Boots, 26 Queens Street & 105 Frederick Street. Tel: 0222 31291.</p> <p>Cardiff. P & P Computers, 41 The Hayes. Tel: 0222 26666.</p>	
<p>WALSHIRE</p> <p>Aberdare. Inkey Computer Services, 70 Mill Street, The Square, Trecoydon. Tel: 0685 881828.</p> <p>Aberystwyth. Aberdata at Galloways, 23 Pier Street. Tel: 0970 615522.</p> <p>Cardiff. Boots, 26 Queens Street & 105 Frederick Street. Tel: 0222 31291.</p> <p>Cardiff. P & P Computers, 41 The Hayes. Tel: 0222 26666.</p>	<p>WALSHIRE</p> <p>Aberdare. Inkey Computer Services, 70 Mill Street, The Square, Trecoydon. Tel: 0685 881828.</p> <p>Aberystwyth. Aberdata at Galloways, 23 Pier Street. Tel: 0970 615522.</p> <p>Cardiff. Boots, 26 Queens Street & 105 Frederick Street. Tel: 0222 31291.</p> <p>Cardiff. P & P Computers, 41 The Hayes. Tel: 0222 26666.</p>	<p>NOTTINGHAMSHIRE</p> <p>Sutton in Ashfield. HN & L Fisher, 87 Outram Street. Tel: 0623 547349.</p> <p>Nottingham. Laskys, 1-4 Smythys Row. Tel: 0602 413049.</p>	<p>NOTTINGHAMSHIRE</p> <p>Sutton in Ashfield. HN & L Fisher, 87 Outram Street. Tel: 0623 547349.</p> <p>Nottingham. Laskys, 1-4 Smythys Row. Tel: 0602 413049.</p>	<p>WALSHIRE</p> <p>Aberdare. Inkey Computer Services, 70 Mill Street, The Square, Trecoydon. Tel: 0685 881828.</p> <p>Aberystwyth. Aberdata at Galloways, 23 Pier Street. Tel: 0970 615522.</p> <p>Cardiff. Boots, 26 Queens Street & 105 Frederick Street. Tel: 0222 31291.</p> <p>Cardiff. P & P Computers, 41 The Hayes. Tel: 0222 26666.</p>	
<p>WALSHIRE</p> <p>Aberdare. Inkey Computer Services, 70 Mill Street, The Square, Trecoydon. Tel: 0685 881828.</p> <p>Aberystwyth. Aberdata at Galloways, 23 Pier Street. Tel: 0970 615522.</p> <p>Cardiff. Boots, 26 Queens Street & 105 Frederick Street. Tel: 0222 31291.</p> <p>Cardiff.</</p>					

BEYOND

CHALLENGING SOFTWARE

NEW

THE GAME WITH
32,000 SCREENS
NOW PLAYING ON COMMODORE 64

The Lords of Midnight is one of
the most exciting games currently
available.
Micro Adventurer

An outstanding success.
Popular Computing Weekly



BEYOND

CHALLENGING SOFTWARE

COMMODORE 64 version



Simply in a different league from
graphic adventures that have gone
before
Your Computer

Once you get into it, The Lords
of Midnight is mind-gripping to an
almost unhealthy degree.
Personal Computer Games

Lords of Midnight is an 'open'
game using intelligent play by the
computer. Routes aren't dictated
by the programmer in advance.
Big K

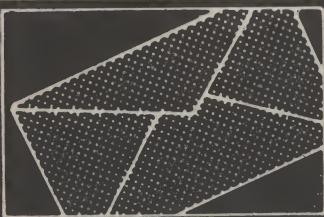


We've created a new programming technique called Landscaping. It provides an epic game with 4000 locations and a stunning 32,000 screen views of Midnight.

Defeat Doomedark, the evil witchking, with Morkin's quest or Luxor's armies. Your skill alone will lead to victory or death.

The Lords of Midnight is more than an adventure, mightier than a wargame.
Your skill alone will lead to victory or death, in the ever changing lands of Midnight

The Lords of Midnight is available now from better software dealers everywhere. Mail Order: **Beyond**, Competition House, Farndon Road, Market Harborough, Leicestershire LE16 9NR. Price £9.95 including P&P. Access & Barclaycard ring: 0858 34567. Cheques & POs made payable to **BEYOND**.



Scouse network

I am investigating the feasibility of creating a network system within the Merseyside Youth Training Scheme. The scheme operates from several different bases within the Liverpool area. Each one of these sites will shortly have its own Commodore 64 computer and printer.

I would like to link these sites to our Head Office 64 in a master/slave arrangement. Ideally this should allow each site to access desk storage/software from the Head Office/Master site plus have the capacity to receive/transmit electronic mail and messages.

I would be most grateful of any information you can provide relating to this idea and its possible implementation. I look forward to hearing from you shortly.

David Cobley,
Merseyside Youth Training,
Inner Temple,
Temple Lane,
Liverpool L2 5RS.
This is rather a tricky one for us. Any Commodore networking experts out there who could help?

Giveaway software

In the January 1985 edition of your magazine there was an article entitled "No Dice!". In this article, some of the games were referred to as 'Public Domain Software'. Please could you tell me what this means, and where such software can be acquired.

Jonathan Platt,
5 Neyland Terrace,
Neyland,
Milford Haven,
Dyfed, Wales.
The term means that no only is there no copyright on

such software, but that it must not be sold for profit. Although it's free, you usually need to be a member of a User Club to acquire it.

Apology speech

May I through your column apologise and thank for their patience all who ordered and had to wait for our Gola-Speech.

The delay was caused by faulty duplication. May I also thank Simon Stable who undertook the re-duplication speedily and efficiently and without whose help we would have been in great difficulties.

I. Elliott,
Gala-Soft,
116 Church Parade,
Canvey Island, Essex.

Vic adventures

Could anyone tell me if 'Savage Island' or 'Mystery Fun House' (Adventures), are available for the Vic-20 or 8K. Or for that matter, would anyone recommend a difficult adventure game for the Vic? Compliments for a good magazine, but couldn't you include more Vic-20 articles?

Niall Ó Cinneáide,
Dún Chasín,
Trá Li,

Co. Chiarrai, Eire.

• What with the new C-16, the Plus/4 and the latest C-128 and Commodore Portable machines to think about, we're struggling for space. At least, Vic Victuals are still a cert.

Hi-Res Santa

I would like to congratulate you (Commodore User) and Melbourne House on your excellent game "Merry Christmas". I was amazed when I saw that the game was only 95p to Commodore User readers. I was even more amazed when I loaded my game to find truly tremendous graphics and animation. As you said in your description

of the game the graphics are so stunning they wouldn't be out of place on a Christmas card. I have only one criticism though, and that is that we were not told in the magazine who to write the cheque out to. Please make this clearer in other offers. I would also like to congratulate you on your December (Christmas) issue of Commodore User. It helped me tremendously to choose my Christmas games.

Paul Moreton,
12 Draycott Drive,
Cheadle, Staffs, ST10 1NH.

Weird effects

As a member of the Association for the Scientific Study of Anomalous Phenomena I am interested in cases of anomalous computer effects.

Can I appeal to readers for any information, at first or second hand, no matter how bizarre, concerning unexplainable malfunction or unexpected output?

All accounts will be treated in strictest confidence, and should be sent to me at the address below.

Roger C Morgan
15a Kensington Court
Gardens,
London W8 5QF.

Pass the puck

As a new owner of the 64, I would be glad if you or a reader could tell me if there is an Ice Hockey or Hockey game on the market, and where I could get it from, or perhaps someone has written one?

Steven Archer,
21 Chapter Road,
Strood.

Kent ME2 3PX.

• Yes, it's called Slap Shot and it's available from Anirog Software, and we'll be reviewing it next month.

A programmer writes

I would just like to say thank you for your very fair reviews

in the February issue of *Dodo Lair* and *Fatty Henry*. As the author of both programs I sometimes feel very bitter about reviews which are inaccurate, from other magazines. I put a lot of effort into both programs and when you see a review saying that 'the main character looks suspiciously like a Vic graphics character' when in fact it is 16 by 16 pixels, user defined, multi-coloured and animated, it tends to make my blood boil.

Thankfully *Commodore User* obviously bothers to play Vic games for a reasonable time (which I wonder how many other magazines do) and also assesses them in accordance with other Vic games, not with the 64.

I can understand different people having different opinions, but I was beginning to wonder if I came from the same planet as most reviewers!

One criticism I would make about your review section is that too much credit from a good review goes to the software house and you don't even mention the programmer/game designer. I would suggest you should print the name of the major contributors to the program above the software house, and if possible do a short interview with the programmer of the 'Screen Star'.

Pop groups' record labels are hardly ever known and it makes sense. For a start programmers are less likely to produce trash if their name is going to be printed next to its review. Also, consumers should not assume two programs from the same software house to be the same quality or style, but two programs from the same author are more likely to be. It would be in the public's interest, besides giving us poor programmers an occasional ego trip.

Peter Bradley,
The Firs,
Elm Park Road,
Pinner, Middx HA5 3LH.

IN YOU WON'T FIND OR . BUT YOU WILL DISCOVER HOW TO PREVENT CONTROL YOUR OR TALK TO THE WITH YOUR



Please send me **Electronics and Computing Monthly** each month for the next 12 months. I enclose cheque/PO to the value of £10.70 (UK). For overseas rates please contact subscriptions dept.

Name _____

Address _____

Signed _____ Date _____

Cheques should be made payable to: **Electronics and Computing Monthly**, Visa/Access, 24 hour answering service, 0858 34004 for subscriptions only. Please send to: **Electronics and Computing Monthly**, Subscriptions Department, Competition House, Farnborough, Market Harborough, Leics.

**ELECTRONICS &
COMPUTING**
MONTHLY

Surprise!



**COMPUTER
& VIDEO
GAMES**

**SPECIAL FREE 32-PAGE
ADVENTURE SUPPLEMENT
ON SALE FEB. 16TH
COMPUTER & VIDEO GAMES**

There's an even bigger surprise in store for you in the March edition of Computer & Video Games. A special 32-page Adventure supplement edited by resident expert Keith Campbell, plus great games listings, reviews, the Top 30 chart and much more. At your newsagent on the 16th of February.

CLASSIFIED

Adventure Helpline The Quest Line, a free service for adventurers, send s.a.e. to Colin Loosemore, 29 Rufus Gardens, Totton, Southampton, SO4 3TA, (0703) 871960 or Tony Treadwell, 41 Fernhill Road, Oxford OX5 1RR.

U.S.A. C64 User Group would like to ex-software and ideas with European groups or individuals. Prefer disk, but will consider tape. Respond to: Metro-Area Commodore Club, Box M, Mendota, Minnesota, 55150 — U.S.A. Or call: (612) 778-8188.

Calling all Commodore Users!

Are you bored with any of your software? Do you think that software costs too much? If the answer to either of these questions is "YES", then you should join our Software Exchange Club. For only 75p per program (or £1.50 for 3 programs), you can swap your software for those programs that you've always wanted. For details, send a stamped addressed envelope to **Mavac Enterprises** 101a Underdale Road, Shrewsbury, SY2 5EF

Vic-20 Word Processing! Tape or disk, needs 8/16K, any type of parallel or serial printer. Full facilities plus footnotes, headings, mail merge, pagination, etc. Details: Atlantic Software, 28 Park Farm Road, Kingston, Surrey KT2 5TQ.

C64 and 1541 disk drive — both complete with boxes, manuals and leads — £235 the two. Easyscript — unused — £35 Telephone 061-941 3102.

Star DP515 9x9 dot matrix Printer. 132 chars width. Many print types. Tractor, Friction or Roll feed. Parallel interface. Boxed etc. £210 including postage. Tel: Banbury (0295) 54946.

WARNING

It is illegal to sell pirated copies of computer games. The only software that can be sold legitimately through our classified section are genuine tapes, disks, or cartridges bought from shops or by mail order from software houses. Commodore User will press for the maximum penalties to be brought against anyone breaking these rules. We regret that due to large-scale swapping of pirated software we can no longer allow swaps of tapes, disks, or cartridges in our classified section.

Vic-20 Word Processor.

Victext Powerful word processor. Facilities include:- Large text buffer, auto centre text, variable tab, insert, amend, delete, copy, move text, word count, right justify, etc. Fully menu driven with comprehensive easy-to-use instructions. Needs + 16K expansion min. Great value: cassette £6.95, disk £9.45.

Vic-20 Data File. Takes the place of any card index.

Facilities include - save, loadfile, full sort, print all/part records, amend, delete records, memory remaining, etc. Needs +8K expansion min. Cassette £4.50. Both programs can be used with all direct connect Vic printers inc 1520 printer plotter. Fast delivery by first class mail. Send cheque/PO to: A&C Software, 75 Oakthorpe Gardens, Tividale, W. Midlands B69 2LF.

Computer penpals write to me by using a program on tape.

Commodore 64 computers only. Send messages to Darren, 9 Heathgreen Close, Chelmsley Wood, Birmingham. I promise to reply.

Commodore modem owner

wanted as penpal on modem. Write to Matthew Middleton, Rushley Walls, Sugar Lane, Whiteley Green, Macclesfield, Cheshire SK10 5SL. All letters answered

Vic-20/CBM64 Software Hire

No membership feel Quality titles (eg Skyhawk, Jetpac Flight O15) from 50p per week. Already 500 delighted members. Join them now. All games originals. Send 2 x 17p stamps for your Hirekit (please state which machine) to:

VSH(CU), 242 Ransom Road, Mapperley, Nottingham.

Vic 20 starter pack +16K speech synthesizer, 6 cartridges, dust covers, joystick, reference guide, reset button, Watson's assembly course, 4 Victape computings, many games and utilities. £18.00. Michael, 0632 2673263 after 6pm.

CBM64 for sale with cassette recorder.

Excellent condition, plus fifteen games including Ghostbuster, Hunchback 2, Kong Strikes Back. £16.00 ono. Tel: 0203 319885 between 5-7.

Wanted CBM64 1520 printer plotter under £85. Please write to Matthew Perks, 116 Oaklands Avenue, Oxhey, Watford, Herts WD1 4LW.

CBM64, C2N tape unit, £50 of software, reference guide, all recently purchased and in excellent condition, £240 ono. Banbury (811 844), after 4 p.m.

DRIVE A TRAIN

Drive in your own home, such famous trains as The Flying Scotsman, Cornish Riviera, Master Cutler and The Royal Scot. Exciting and addictive games for the rail enthusiast and layman alike.

Our latest game — ROYAL SCOT.

From Euston to Crewe with a choice of motive power — class 87, Advanced Passenger Train and class 86, CORNISH RIVIERA. From Paddington to Exeter with a stop at Reading hauled by H.S.T. class 47 or class 50, MASTER CUTLER. St Pancras to Leicester fast or stopping (6 stations) behind Peak class 45, 47 or H.S.T. FLYING SCOTSMAN. A fast dash from Kings Cross to Doncaster behind the legendary Deltics, H.S.T or Brush 47. All of the above games available for the BBC 'B', CBM64 and Spectrum 48K price £7.50 each inc. P&P.

Available from:
DEE-KAY SYSTEMS (Dept CS)
18 Salford Close, Woodrow South,
Redditch, Worcs B98 7UN.

CBM64, C2N cassette, 1520 printer + all manuals, introduction to basic. Joystick + paddles. Various cassette and cartridge games. £35.00 ono. Phone 0257 793762.

The Friend; an essential toolkit for the Commodore 64. Features bi-directional listing, renumber, rescue, auto line, coding of graphic symbols for listings, block delete, programmable function keys, disk operating system supporting scratch, rename, copy etc., sprite control, numeric conversions, melody key beep, trace plus speed control, merge, append, chain, variable dump, printer command and more than you ever need!! All this for only £10.00 disk, £8 cassette. Send P.O./cheque to William Fong, 5 The Birches, Victoria Way, Charlton SE7 7PB

AD INDEX

Adamsoft	28, 71	Holt Saunders	44
Adman	48	Interface	80
Anirog	IFC, 18, 76	Micro-de-Bug	28
Arrow	71	Micronet	81, 82, 83
Associated Services	16	Mikro-Gen	75
Audiogenic	OBC	Mirage	20
Beyond	84, 90	MPS	71
Calco	28, 39	Mushroom Software	65
Cheetah Marketing	26	New Generation	39
Chromasonic	58	Ocean	42, 43, 78
Club 64	39	Precision	79
Commodore	10, 11	Shekana Computers	69
Compunet	34, 35	SMT	4
DACC	71	Sophisticated Games	69
Deals for Readers	31, 32	Taskset	IBC
DK Tronics	23	The 64 Software Centre	69
Dorling Kindersley	60	Touchmaster	57
Electronic Aids	28	U.S. Gold	9, 41, 52, 59
Evesham Micros	15	Zoomsoft	69

CLASSIFIED

COMMODORE 64 DATABASE DATAFILE

Powerful options include: Print all/selective records, delete, amend, save, load, copy, alphanumeric sort, user defined fields, memory check, total numeric fields, multifield interrelational, global and between limits searches etc. Fully Menu driven with comprehensive easy to use instructions. Disk and cassette fully compiled. (Can be used with 1515, 1525, 1526 GP 100VC, MPS 801, MPS 802, DPS 1101 printers and 1520 printer/plotter if required and most centronics with suitable hardware interface.)

Outstanding value:- cassette £7.45, disk £10.25 fast delivery by first class mail. Send cheque/postal order to:-
A+C Software, Dept 3, 75 Oakthorpe Gardens, Tividale, West Midlands B69 2LF. 021-557 8596

COMMODORE 64 AND VIC-20

TAPE BACK-UP BOARD

For the Commodore 64 and Vic-20. When a second CBM type cassette unit is connected to this board, it will make security back-up copies of cassette based software, including turbo/fast loaders, Basic and/or machine code and data files. Priced at £9.50 plus 50p p&p UK (Europe add £1.00, elsewhere add £2.00). An optional reset switch can also be fitted for only £2.00 extra, inclusive of postage.

RESET SWITCH

This neat, ready to use switch is a must for all serious Commodore 64 and Vic-20 owners. The switch plugs into the rear of your computer and can be used even if you have a disk drive and/or a printer attached. Priced at just £3.95, inclusive of p&p UK (Europe add 75p, elsewhere add £1.50).

All orders are sent by first class post. Add 25p for recorded delivery per order in UK or add £1.25 for registered delivery abroad. Send cheque/p.o., or stamp for full details to:

**CLARK KENT SOFTWARE
15 BAMBURG CLOSE, CORBY, NORTHANTS, NN18 9PA.**

earlybird TIMES-TABLE

FOR COMMODORE 64

First in a series of Early Learning Computer Tapes for 4-10 year old children. Personalised Program uses colours, graphics and sound to full effect. 'Earlybird' rewards correct answers making learning fun.

£4.50 +45p P&P
Earlybird 31 Gleneagles Drive, Penwortham Preston, Lancs. Tel: Preston (0772) 742618



STEVE JACKSON'S
SWORDMASTER
SERIES

Adventure
INTERNATIONAL™

85 New Summer Street, Birmingham B19 3TE Tel: 021-359 0801

COMMODORE 64 OWNERS

MIDLAND COMPUTER LIBRARY

The First & Largest Commodore Library in the World

(often copied but never equalled)

- 1 All the latest titles on cassette, disk and cartridge
- 2 Hire your first game absolutely free
- 3 Life membership £6
- 4 Hire charge from only £1.25 inc p&p for full 7 days
- 5 No limit to the amount of games you can hire
- 6 All games originals with full documentation
- 7 Games, Business and Educational software
- 8 Return of post service
- 9 Lowest new hard and software prices in the UK
- 10 Join now on 14 day money back guarantee
- 11 Over 1,000 games in stock inc. many US imports

Send cheque/PO for £6 with your first selection, or large SAE, for further details, stating machine to:

MIDLAND COMPUTER LIBRARY

31 Evenlode Close, Lodge Park,
Redditch B98 7NA
Telephone 0527 23584 Dept. CU



CLASSIFIED ORDER FORM

Lineage —

Free to private individuals —
 20 words min — 40 words maximum.
 30p per word to Trade.
 20 words min — 40 words maximum.

Semi-display — £7.50 for S.C.C.
 Ring 01-251 6222.
 All classified and semi-display advertising is pre-payable.

1	2	3
4	5	6
7	8	9
10	11	12
13	14	15
16	17	18
19	20	21
22	23	24
25	26	27
28	29	30
31	32	33
34	35	36
37	38	39
40		

All classified ads are subject to space availability

PLEASE PRINT IN BLOCK CAPITALS

I enclose cheque/P.O. for £..... made payable to **Commodore User**.

Name.....

Address.....

Total number of words.....

Post to: **AD. DEPT. COMMODORE USER, 30-32 FARRINGDON LANE, EC1R 3AU.**

Warning
It is illegal to sell pirated copies of computer games. The only software that can be sold legitimately through our classified section are genuine tapes, disks, or cartridges bought from shops or by mail order from software houses.
Commodore User will press for the maximum penalties to be brought against anyone breaking these rules. We regret that due to large-scale swapping of pirated software we can no longer allow swaps of tapes, disks, or cartridges in our classified section.

PRINTER BARGAINS — PRICES INCLUDE VAT + CARRIAGE

SEIKOSHA GP100VC..only £149 Made for the Commodore	BROTHER M1009 only £178 High quality Printer at low price.
Shinwa CPA80-C/100CPS new model for Commodore.....£249	Cable inc.
Epsom RX80FT only £264	Brother HR5 only £149
Daisy Step 2000 £264	Kaga Taxan KP810 £299
Smith Corona TP-1 £209	Cannon PW1080A £319
Interfaces £22 + £45	Mannesman Tally MT80....£219

Payments to: **STRONG COMPUTER SYSTEMS**

Bryn Cottage, Peniel, Carmarthen, Dyfed
Tel: 0267 231246 for further details

COMPUTAPE (Dept. YT23), 27 COOMBE ROAD,
SOUTHMINSTER, ESSEX. CM0 7AH.
Tel: 0621 772589

COMPUTAPE's new Catalogue has over 300 different software titles available for the Commodore 64 all at Discount Prices. e.g.

	RSP	Our Price
Alien	£8.99	£7.80
American Football	£9.99	£8.50
Beach Head	£9.95	£8.50
Blockbusters	£8.95	£7.70
Bruce Lee	£9.95	£8.70
Daley Thompson Decathlon	£7.90	£6.50
Football Manager	£7.95	£6.50
Ghostbusters	£10.99	£9.50
Hunchback II	£7.95	£6.70
Indiana Jones in Lost King	£9.95	£8.50
Raid Over Moscow	£9.95	£8.50
Return to Eden	£9.95	£8.50
Steve Davis Snooker	£7.95	£6.80
Tim Loves Cricket	£7.95	£6.80
Triподы	£11.50	£10.20
Valhalla	£14.95	£11.90
World Cup Football	£7.95	£6.80
Zaxxon	£9.95	£8.50

To order any from the above please write enclosing a Cheque/P.O. made payable to **COMPUTAPE** and post to the above address. Prices are inclusive of Postage, but please send SAE for Catalogue only.

COMMODORE 64 **TAPPA · TESTS** **COMMODORE 64**

* TABLE · TAPPA	A TIMED TABLE TEST
* SPELLA · TAPPA	HOMEWORK SPELLING THE EASY WAY. A TEST ON YOUR OWN WORD LIST.
* VOCAB · TAPPA	TEST YOUR OWN FRENCH VOCAB. CEDILLA AND ACCENTS ON FUNCTION KEYS.

... ALL THREE SUITABLE FOR ANY AGE ...
... SET YOUR OWN STANDARDS ...

cassette 2 for £7.50 all three on disk
based £3.99 ea. 3 for £10.00 £12.00
Cheques or P.O. to Prices include P&P

KEPIWARE

23 S. James Road, Birmingham B15 2NX.

NUMERIC KEYPAD

FOR CBM 64 & VIC 20

- Hooks into keyboard
- Not software driven
- Compatible with all commercial software
- Leaves all ports free
- Full travel key switches

cheques/PO to:-

COMMERCIAL PRODUCTS ONLY **£29.95**

11 Hylands Close, Furnace Green,
Crawley, Sussex RH10 6RX (0293) 30174

• Includes
RETURN
key

BBC B
£44.95



THE COMPLETE C64 & VIC-20 CATALOGUE OF COMMERCIAL SOFTWARE

If you are an individual, dealer, user group or software library this is a must for you. A catalogue that covers games, utilities, education and business software. You get a description, hardware configuration, price, suppliers names and addresses and independent rating of value for money — all in an easy to refer to format. With over 350Kb of information and thousands of entries it is a must for all serious users — all for only £5.50 UK, £6.50 overseas.

Send cheque or P.O. to Cementis Information, 6 Richardson Road, Stoney Stanton, Leicestershire LE9 6TR.

ASSEMBLER 64. Professional development tool. Full assembler/disassembler allowing LABELS, VARIABLES, PSEUDO OPS and CONTROL COMMANDS. £11.99

DATABASE 64. Menu driven database. Max 30000 records, 255 bytes/record, 15 fields/record. CREATE database. ADD, INSERT, DELETE, AMEND records. SEARCH for records on any field including wild card matching?*,. LOAD/SAVE databases to tape/disk. SCROLL through database. £11.99

Zoom Pascal	£24.95	Practifile	£37.00
Oxford Pascal	£56.75	Calc Result - Easy	£47.00
Superbase 64	£79.00	French 64	£12.95
P.S. Prog. Spreadsheet	£59.00	German 64	£12.95
Paperclip	£75.99	French 64 & German 64	£16.95
Multiplan	£81.00	Koala Pad	£76.00
Anatomy of 1541 d/drive	£10.95	Synthy 64	£12.50
		All prices disk.	

SAE full catalogue (over 100 programs, including databases, word processors, spreadsheets, compilers, education, accounting, utilities, books & more).

DYNAMITE SOFTWARE DEPT C.U.
BCM 8713 LONDON WC1N 3XX

Free Assembler 64 or game with
every order over £15. Disk or tape.

NEW RELEASES FROM HARBOURSOFT

FAMILY FUN IN FAULTY TOWERS

HELP BASIL KEEP HIS SANITY AND HIS HOTEL OPEN IN SPITE OF THE HEALTH INSPECTOR! HIT MANUEL AND INSULT SYBIL FOR EXTRA POINTS! ALL YOUR FAVOURITE CHARACTERS APPEAR IN THIS ADVENTURE ADAPTATION WITH A DIFFERENCE. GREAT FUN. COMMODORE 64 TAPE. SPECTRUM 48K TAPE £5.95.

ADULT ADVENTURE
WITH

JOLLY JACK'S

RUN A SHORE!

FOLLOW JACK ON HIS FIRST NIGHT ASHORE AFTER 3 MONTHS AT SEA WITHOUT BIRDS OR BOOZE! A FUN AND FROLIC PACKED ADVENTURE WITH NAUGHTY BITS!! COMMODORE 64 TAPE £6.95. SPECTRUM 48K TAPE £5.95 (OVER 18's ONLY).

AND FOR THE REALLY
BROAD-MINDED

LOVE BYTES!

ADULT FOREFEITS AND REWARDS GAME WITH ARCADE ACTION. "POSITIVELY THE NAUGHTIEST THING YOUR CBM 64 EVER DID!" COMMODORE 64 ONLY: TAPE £5.95 (OVER 18's ONLY)

CHEQUE OR POSTAL ORDER TO:

HARBOUR SOFTWARE
134 EAST WEARE ROAD, PORTLAND, DORSET

Tel: (0305) 820487

DEALER ENQUIRIES INVITED

USING A 1541 WITH YOUR CBM 64?

TIRED OF WAITING FOR YOUR PROGRAMS TO LOAD? SICK OF CASSETTE OWNERS SAYING THEIR SYSTEM IS FASTER THAN YOURS?

SUFFER NO MORE!

BUY NEW **DREAMLOAD** AND YOUR PROBLEMS WILL VANISH! PROGRAMS BY UP TO FIVE TIMES NORMAL SPEED.

WE CHALLENGE YOU TO FIND ANYTHING FASTER!

FOR YOUR **DREAMLOAD** PROGRAM, SUPPLIED ON A HIGH QUALITY DISK, SEND CHEQUES/PO'S FOR £7.95 (inc. P&P) PAYABLE TO:

DREAMSCAPE SOFTWARE
c/o 49 EASTBANK STREET,

SOUTHPORT, MERSEYSIDE PR8 1EB.

IT WILL BE THE BEST £7.95 YOU'VE EVER SPENT!

COMMODORE 64 RESET SWITCH

Resets Basic but leaves machine-code intact. Audio socket for monitoring included. Two serial sockets also for onwards connection to printers, disk drives etc.

£6.99

CHEQUE OR POSTAL ORDER TO:

HARBOUR SOFTWARE
134 EAST WEARE ROAD, PORTLAND, DORSET

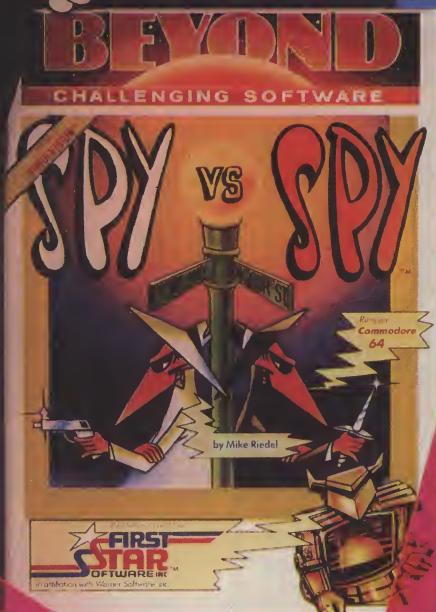
Tel: (0305) 820487

DEALER ENQUIRIES INVITED

BEYOND

CHALLENGING SOFTWARE

Now on
Commodore 64



Spy vs Spy is two player cartoon fun!
The black and white spies chase each
other around the embassy.

They steal secrets and plant
traps, playing against each
other on a split screen display.

Available from software dealers everywhere or direct from
Beyond Competition House, Farndon Road, Market Harborough, Leicester LE16 9NR.
Access/Barclaycard telephone: 0858 34567. Price £9.95 inc. P&P

TASK SET!

THE BUG STOPS HERE!

CAP CAM

CAP
CAM

WARRIOR

commodore

64

£9.95

JUST PICTURE IT!



JUST PICTURE IT - BEING ABLE TO DRAW YOUR OWN HIGH RESOLUTION GRAPHIC DESIGNS ON YOUR COMPUTER SCREEN WITHOUT HAVING TO WRITE A PROGRAM . . . !

Well, now you can - with the amazing Koala Pad from Audiogenic!

The Koala Pad touch tablet provides the direct link between you and your screen! It plugs into your Commodore 64 and lets you paint directly onto the screen with a selection of brush sizes and a choice of 16 colours and 16 shades from your software palette.

But that's just the beginning - because every Koala Pad package includes the incredible Koala Painter software which makes it child's play to . . .

- **Fill outlines with a colour!**
- **Draw straight lines!**
- **Make frames!**
- **Draw circles!**
- **Plot radians from a point!**
- **Move objects around!**
- **Copy shapes!**
- **Create mirror Images!**
- **Zoom in on an area!**
- **Swap shapes between two pictures!**
- **Save your pictures to disk or tape!**

The program is controlled entirely from the tablet by moving a cursor arrow around to the different menu option. An optional Programmers Guide is also available to tell you how to incorporate Koala Pad pictures into your own programs.

Now you don't have to be an experienced programmer to produce real high resolution graphics on your computer - the Koala Pad from Audiogenic makes it as easy as a pencil and paper. Just picture it!



Available with Cassette or Disk software for the commodore 64

From all good computer shops - or direct from Audiogenic - just fill in the coupon!



Please send me (QTY) Koala Pad Disk/Cassette*. I enclose cheque/P.O. for
Commodore 64 Disk or Cassette £79.95†

THE KOALA PAD IS A PRODUCT OF

Koala
Technologies Corporation

Exclusive distribution in U.K. and Eire by

Audiogenic LTD

†Price subject
to change
without notice

*Please charge to my Access/Barclaycard/Trustcard account no:

*Delete/complete
as applicable

Signature

Mr/Mrs/Miss

Address

P.O. BOX 88, READING, BERKS.